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See pages 19, 20, 22, 24, 117, 119 for catalogs and publications on municipal and civic subjects

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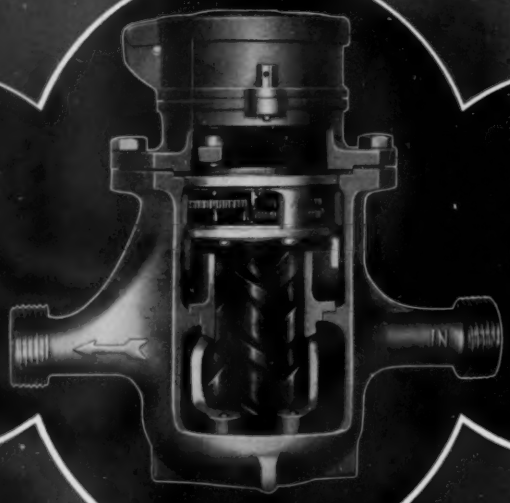

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The first practical innovation in domestic water meter design and construction to be offered the American Water Works trade in over 50 years.

The PITTSBURGH IMO WATER METER

Enthusiastically received, praised, tested and proven—that's been the reaction of water works men since the first announcement of the Pittsburgh IMO Meter. There is no other meter like the IMO. No other meter can even approach its performance, its accuracy on low flows, or match its straight line accuracy curve.

This unequalled performance results from the fact that the Pittsburgh IMO is the closest approach to a true positive displacement meter now made to measure water. *It is not a current or inferential type meter.* Its success is based upon the unique measuring chamber encasing three meshing and rotating hard rubber screws. Noiseless operation, without pulsation, is an important factor.

It has been determined that the Pittsburgh IMO Meter will pay for itself in a comparatively short time through measuring the trickles of water which the conventional meter will not record.

It will pay you to get the whole story on the Pittsburgh IMO Meter. Write for Bulletin W-525.

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THE MOST ACCURATE WATER METER EVER COMMERCIALLY BUILT

Quality, or Price, in Public Buying?

FROM several sources THE AMERICAN CITY has been urged to help clarify the prevalent confusion as to how far municipal officials ought to go—or legally may go—in awarding contracts on any basis other than price for competitive types of equipment for local public works financed in part by PWA grants.

It is generally agreed, of course, that in routine purchases of competitive materials and supplies for which comparable bids can be secured under carefully drawn specifications the award ought to go to the lowest responsible bidder. But what about other types of equipment as to which standardization or ultimate economy, rather than price alone, ought to be the determining factor? Here the decision is not so easy.

It seems to be too generally assumed by municipal officials that under the PWA regulations, as in some cases under state laws or city charters, they are unable to give adequate consideration, when placing contracts, to their own experience or that of other cities with the actual performance over a period of years of specialized products not competitive in price. The need for such freedom of choice—with restrictions to safeguard the public interest—has been recognized, however, by Administrator Harold L. Ickes and the staff of the Public Works Administration.

To Aid Standardization or Ultimate Economy

In the official statement of "Terms and Conditions" (PWA Form No. 230), Part IV, Paragraph 2, reads as follows:

"*Construction by Contract.*—All work on the Project will be done under contract. The Applicant will give every opportunity for free, open, and competitive bidding for each and every construction, material, and equipment contract. The Applicant will give such publicity to advertisements or calls for bids by it for the furnishing to it of work, labor, materials, and equipment as will provide adequate competition and the award of each contract therefor will be made to the lowest responsible bidder as soon as practicable: *Provided*, That in the selection of equipment or materials the Applicant may, in the interest of standardization or ultimate economy, if the advantage of such standardization or such ultimate economy is clearly evident, award a contract to a responsible bidder other than the lowest in price."

This important provision is elaborated in Administrative Order No. 125, Paragraph 5 of which gives a precise definition of what proof shall be offered to the Regional Director of PWA in the case of a contract to be let in the interest of standardization or ultimate economy. This stipulation, strict enforcement of which is sought by PWA, provides that:

"Proof that such an award, if made, will be in the interest of standardization shall include a showing that like equipment or material already forms a reasonably large part of what will be the complete installation and that the prices quoted by the contemplated awardee for the desired equipment or material are not materially in excess of those quoted by the lowest responsible bidder for similar equipment or material complying with the specifications. Proof that such an award, if made, will be in the interest of ultimate economy shall include a showing that such alleged economy is based primarily on a reasonable method of evaluation sufficiently developed to permit precise mathematical computation and sufficiently clear that a competent and disinterested person having the particular facts presented to him would be convinced beyond a reasonable doubt of the ultimate economy of the contemplated award."

To Obviate Favoritism or Collusive Bidding

To minimize the possibility of favoritism or collusive bidding when local officials wish to exercise their privilege of specifying their preference for a particular process, type of equipment or kind of material, Paragraph 6 of the above-mentioned Administrative Order specifies that:

". . . . the Regional Director shall require that such preference be specified in such manner as to permit competitive bidding within such process, type of equipment, or kind of material, and that such documents also contain a statement to the effect that if the lowest bid submitted by a responsible bidder offering such preferred process, type of equipment, or kind of material, is within the funds available to finance the contract, the award, if made, will be made to such bidder, unless such award is made under the provisions of Paragraph 5 hereof. Thereafter, if the lowest bid submitted by a responsible bidder offering such preferred process, type of equipment, or kind of material, is within such funds, the Regional Director shall not approve of a contemplated award of the contract to other than such bidder, unless such award is made under the provisions of Paragraph 5 hereof, even though another responsible bidder submits a lower price for an alternative process, type of equipment, or kind of material. If no such preference is so specified, all processes, types of equipment or kinds of material shall be regarded by the Regional Director as being on the same competitive basis."

A further stipulation prohibits the Regional Director of PWA from approving a contemplated award of a contract to other than that responsible bidder whose bid is actually lowest, even though the local government expressed its desire to give consideration to "reliability, efficiency, cost of operation, etc.," unless that government shall have complied with the requirement first quoted above from Paragraph 6.

More general understanding of, and action under, the regulations above cited will secure for many local governments higher permanent values from their PWA grants. And as to municipal buying in general, readers may be glad to be reminded of an editorial statement published in THE AMERICAN CITY three years ago this month:

Buy Quality

"Most purchasing officials of American municipalities have definitely reached the conclusion that it is not first cost which is of the utmost importance in the purchase of equipment, machinery and supplies for municipal use. The elected or appointed official naturally wishes to show savings in the operation of his department, but these savings can be brought about by proper organization and the careful elimination of waste, rather than through the purchase of 'cheap' materials and equipment which may become the most expensive purchases in the long run. Municipal officials are being judged more and more by their actual accomplishment for the good of their departments and cities rather than by 'grandstand' savings of a temporary vote-getting nature.

"The bugaboo of contract awards, whereby a purchase must be made at the lowest price from the 'lowest responsible bidder,' has vanished through the writing of comprehensive specifications which insure quality from the 'lowest responsible bidder' rather than an imitation of quality sold at a low price requiring expensive maintenance throughout the life of the equipment, and resulting in early obsolescence.

"It is well known in the machinery field that the operation of most out-of-date equipment is expensive. Statistics show that such maintenance and operating costs together may be as much as 30 per cent more than the operating and maintenance costs of new equipment embodying the latest designs and power-saving devices. Early obsolescence is an earmark of bargain purchases which have heretofore been too popular with over-ambitious officials too anxious to obey the demand for lower budgets.

"Buy quality and save money!"

From the Report of August 1, 1938, by Russell Forbes, Commissioner of Purchase, on the Work of the Department of Purchase, City of New York:

"Marked progress has been achieved in two directions which are commonly overlooked as functions of a central purchasing department—to *prevent the purchase* of unnecessary articles and to *increase the price* paid for essential items by securing higher quality. The new "open door" policy in the Budget Director's office made possible a closer coordination and resulted in stopping the expenditures of large sums of public funds for articles which were not vitally necessary to the successful functioning of various agencies. With the aid of representatives of the using departments, we were able to make some progress in improving the quality and increasing the price paid for paint and similar articles in which the labor cost of installation exceeds the cost of materials."

Another Big Paper Mill

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WITH a capacity of 18,000,000 gallons daily, three Layne designed, drilled, and turbine pump equipped wells now serve the Brunswick Pulp and Paper Company's newly erected Brunswick, Georgia, plant. These Layne wells were successfully passed through, and cemented against, bad water formations,—a task that required much skill and care. Special equipment was necessary to core through hard limestone formations for the setting of full size, 3/8 inch thick by 18 inch diameter, welded continuous steel casings. The casings were then cemented at the bottom to the Eocene formation.

So again Layne does an outstanding job on a difficult undertaking.

Industries or municipalities contemplating the installation of a new water supply system, or seeking a reduction in water costs, may obtain valuable information by addressing Layne & Bowler, Inc. Here they will be guided by the World's most respected Deep Well water production experience. And, of course, Layne Pumps are equally well known for their records of high efficiency, long life, and low cost. For literature or consultation, without obligation, address LAYNE & BOWLER, INC., DEPT. B., Memphis, Tenn.

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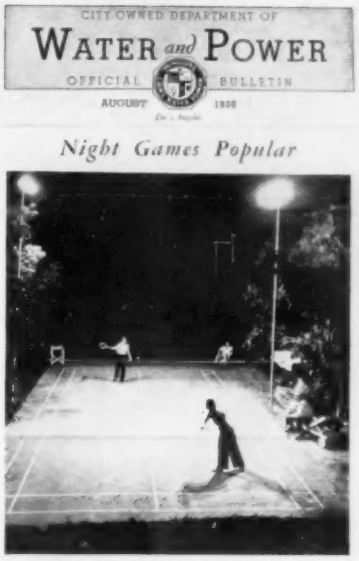
Our Municipal Notebook

Municipal Plant Builds Load

WHATEVER gets stronger must grow, and that is one of the reasons why municipal electric utilities should endeavor by sound means to increase their connected load. Those having sharp eyes or microscopes can read the legend at the bottom of the reproduction (at the right) of the cover of the August bulletin of the Los Angeles Bureau of Light and Power: "Outdoor lighting enables all the members of the family to join in night-time recreation right in their own back yard. Operating costs, at municipal rates, are only a few cents an evening." Another page in the bulletin advertises a free wiring plan in connection with an electric range.


CITY OWNED DEPARTMENT OF
WATER and POWER
OFFICIAL BULLETIN
AUGUST 1938

Night Games Popular

Transportation Company Wins New Customers

THE Shreveport, La., Railways System is proud of its service and sells it aggressively through a comprehensive public-relations program which includes:

1. A civic ceremony inaugurating each new trolley-coach line, with newspapers assisting editorially.

2. Frequent good-sized ads in local papers.

3. Spot radio ads pointing out the advantages of using the company's new facilities every hour on the hour over the local station, from 7:30 A.M. to 9 P.M.

4. A personal letter from the president of the transit company to each new resident of the city, inclosing a free strip of tickets.

5. Display posters inside and outside the new trolley coaches.

6. Pamphlets and circulars distributed in the coaches.

7. Minstrel shows given by the company, the price of admission being a round-trip ticket on one of the bus lines, with part of the programs broadcast over the local stations.

8. Operators instructed in courtesy and the technique of selling rides. They are taught to regard each passenger as a contributor of from $25 to $50 per year to the company, and any discourtesy reported is a capital offense.

Why has this type of program been successful in Shreveport? Obviously, because it is sincere and consequently is met at least half-way by both city officials and riding public.

ONE OF 44 BRILL-BUILT TROLLEY COACHES WHICH INCREASED SHREVEPORT'S RIDING FROM 9½ MILLION RIDES IN 1929 TO 12¾ MILLION IN 1937

A. A. A. Reads Parking-Meter Statistics

THE American Automobile Association, which has opposed parking meters on the ground that they impose one more tax on the motorist, released on August 3 a long review of the comprehensive statistical report on Parking Meters made by the New York Bureau of Municipal Information, Albany. "The Survey," says A. A. A. "does not support charges made last spring by the American Automobile Association that the meter companies sell their devices at substantially 'fixed' charges. Eighteen cities paid exactly $58 for their meters, but virtually all these were sold by the same company."

The A. A. A. report closes with a summing-up of the figures in the report. All the 37 cities agreed that the meters had effectually reduced cruising; all but one agreed that meters speeded the flow of traffic and allowed more cars than formerly to find parking spaces—three times as many, says Wilmington; four times, says Dallas; five times, say Clarksburg and Passaic; 100 per cent improvement say Austin, Hagerstown, Oklahoma City, Omaha, Pocatello and Toledo.

The New York Bureau of Municipal Information is to be congratulated again on this clear factual report which has answered questions for many people who wanted to know more about parking meters in service.

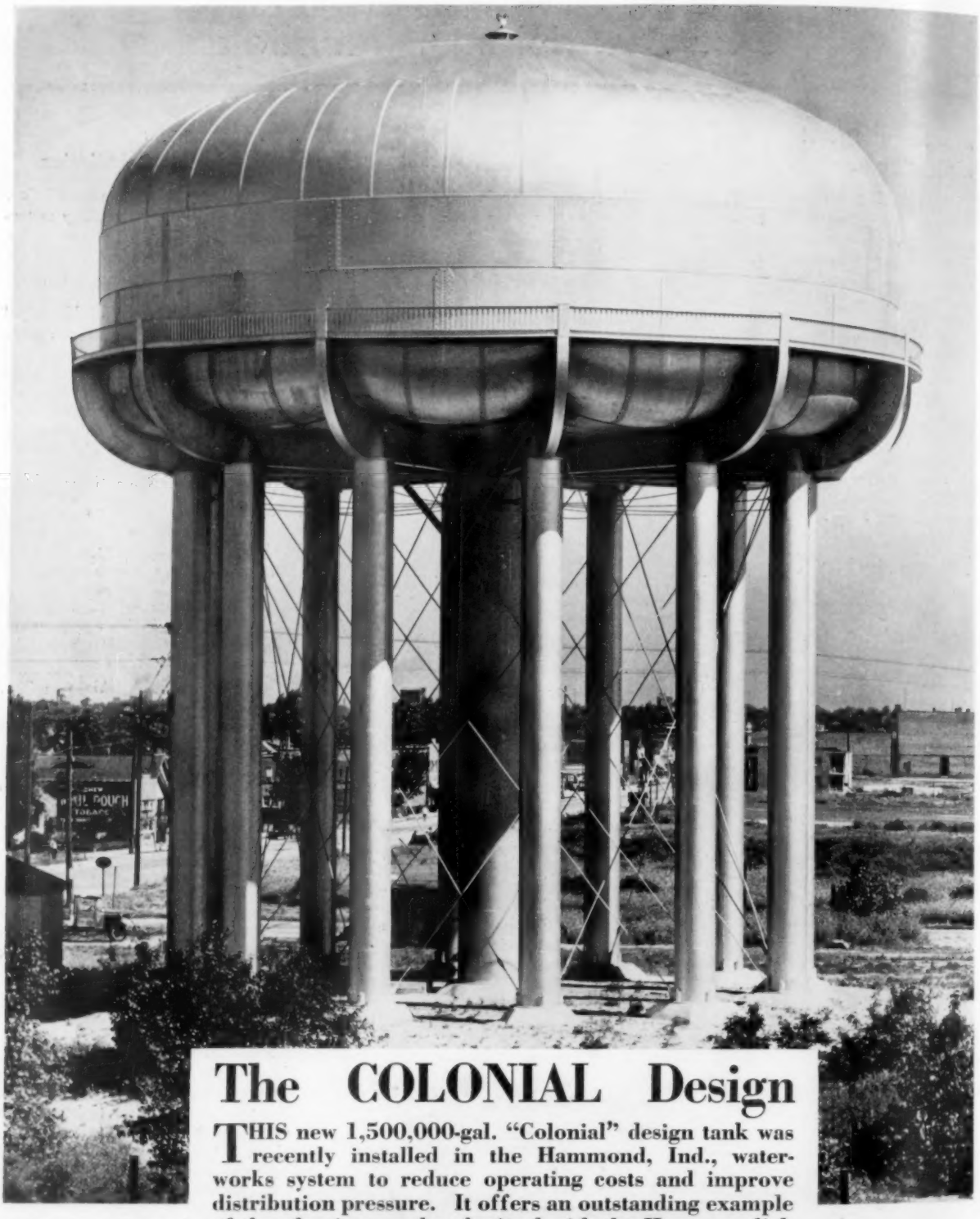
Visible Card Records

THE prime advantage of many of today's office systems is not so much that they make it possible to do work faster than with the old system, but that there is no old system for doing this work which would not be done at all except for the economies in time made possible by the modern system.

If two clerks in the Civil Service Commission of San Francisco can perform all the postings necessary to keep up to date the records of 10,000 employees and eligibles, it is obvious that a portion of one person's time will suffice to perform this similar work in many smaller communities.

San Francisco uses the visible Kardex system; buff cards representing permanent employees, white cards eligibles. A system of colored signals on the white cards, together with code letters, gives instantly the status of each eligible without any handling of the cards.

This type of card system—easy to keep and use—is gaining popularity, and an increasing number of municipal departments are finding it a valuable tool.



The COLONIAL Design

THIS new 1,500,000-gal. "Colonial" design tank was recently installed in the Hammond, Ind., waterworks system to reduce operating costs and improve distribution pressure. It offers an outstanding example of the pleasing results obtained with the Horton radial-cone bottom construction. Address our nearest office.

CHICAGO BRIDGE & IRON COMPANY

Chicago.....2127 Old Colony Bldg.	Philadelphia..1616 "1700" Walnut St. Bldg.	San Francisco.....1033 Rialto Bldg.
New York.....3308-165 Broadway Bldg.	Boston.....1501 Consolidated Gas Bldg.	Houston.....2919 Main Street
Cleveland.....2236 Rockefeller Bldg.	Birmingham.....1502 N. Fiftieth Street	Tulsa.....1625 Hunt Bldg.
Detroit.....1501 Lafayette Bldg.	Dallas.....1406 Liberty Bank Bldg.	Los Angeles.....1403 Wm. Fox Bldg.

Fabricating plants in CHICAGO, BIRMINGHAM, and GREENVILLE, PA.

Water-Works Operation

HERE IT IS—THE "BELIEVE IT OR NOT" OF WATER WORKS!
The lead gooseneck with roots in it removed from an active service in Greenwood, S. C.

Roots in a Water Service

THE water service depicted above was exhibited at the American Water Works Association convention at New Orleans and caused considerable comment. It hardly seems possible that a root could enter through a pinhole in a lead gooseneck and almost completely block the line, when it had to enter against a pressure of 50 to 60 pounds.

A 6-inch cast iron main was laid in Greenwood, S. C., in 1916, and this lead gooseneck tapped in. It is known that the pressure on the line had not been off for over seven years, and for most of that time the pressure on the line had been 50 pounds, and for the last nine months the line was used the pressure had been 60 pounds because of the recent installation of a 300,000-gallon elevated storage tank.

The customer whose house was served through this gooseneck had noticed a decrease in the flow and a reduction in the pressure at least six months before the spring root growth of 1938 decreased the flow so seriously that the customer complained to the Department. During all this, none knew that a root was the cause of the trouble. The Department believed that the decrease in pressure was due to corrosion in the galvanized service line from the meter at the curb line to the house, and told the customer that it would be glad to investigate and if the trouble was between the meter and the house the customer would have to pay the costs.

The trench was opened and the connection was just at the curb. All new mains in Greenwood are located in the park area between the curb and the sidewalk. As soon as the excavation reached the elevation of the gooseneck one of the employees noted that there was a mass of roots around the gooseneck. After removing the roots, he hammered the pinhole shut but noticed that there was a root of a water oak at the hole in the gooseneck. When the gooseneck was disconnected to make a further examination, the long root shown was found. The service was replaced with a complete copper service line between the meter and the main. This was done on February 15, 1938.

F. W. Chapman is Superintendent of the Water and Light Department of Greenwood, S. C., to whom we are indebted for the information about the service and for the illustration.

New England Water Works Association
September 13-16, 1938
Hotel Statler, Boston, Mass.

Water-Works History Shown in Exhibit

THE city of Jackson, Miss., has developed a fine sense of the value of publicity both within its own limits and outside. Many of our readers will recall the article (December, 1937, page 51) on the use of signs on all city vehicles, from garbage trucks to the street cleaning equipment, showing how the tax dollar is spent and other instructive information. That all started with a municipal parade at the city-operated State Fair held each year in Jackson. The fair has grown and taken the fame of the capital city of Mississippi to every section of the state.

Recently a local group, The Pioneers Club, composed of members of families that have lived in Jackson for fifty years or more, requested the Water Department to prepare an exhibit for a meeting to be devoted to the history and the development of the local water supply. These meetings are held irregularly but are always devoted to some activity of the city, one being given over to the Fire Department, when the oldest fireman was a guest of honor and some very old fire-fighting equipment was displayed.

At the meeting devoted to the water works the Department supplied a very interesting exhibit that created a great deal of comment and was displayed for some time after the meeting in the through-corridor of the historic old City Hall, outside the offices of the Water Department and the City Engineer. The display was on a table some 20 feet in length, and started with a typical hillside spring in miniature similar to those on which the old families depended for their water supply. Next to it was a very good reproduction, on a small scale, of a well of the "old oaken bucket" type, and, next, a pitcher pump, which is still used to a considerable extent in the rural sections. The fourth and fifth exhibits were 5-gallon jars of river water, and the filtered water as delivered to customers now. The original water works established in 1888 pumped raw silt-laden river water into the mains, and each house was equipped with a stone filter which, according to J. J. Halbert, City Engineer, had to be cleaned three times a day to get water through them.

At the end of the line was a photograph of the present 12-mgd filtration plant which supplies 5 mgd regularly to the city of 60,000 population. With this was a colored model of the new 500,000-gallon elevated steel tank (The American City, May, 1938, page 40) which has been added recently to the system. In addition, there were displayed framed groups of photographs of the interior and exterior of the old and new pumping stations. The latest consists of two 4-mgd and two 6-mgd centrifugal pumps with a horizontal steam pumping engine as a standby.

This "Evolution of Jackson's Water Supply" has created a great deal of interest on the part of those visiting City Hall to see the constantly changing exhibits in the corridor, or merely those who have come to pay their water bills or to look up some property line on the maps filed in the City Engineer's office.

T.R.K.—849.

THE EXHIBIT IN THE CORRIDOR OF THE HISTORIC CITY HALL OF JACKSON, MISS., SHOWING THE CHANGES IN ITS WATER SUPPLY FROM HILLSIDE SPRING TO THE NEW FILTRATION PLANT AND ELEVATED STEEL STORAGE TANK

DOWN GOES THE COST OF SWEEPING CITY STREETS
Another White Wing starting on its way to reduce the cost of sweeping streets
STATE HIGHWAY COMMISSION OF INDIANA NO. 1
BYERS WHITE WING

With Byers White Wing, the *original* modernized street sweeper

90% of the refuse found on city streets is deposited finally within 18" of curb.

●

Byers White Wing sweeps this vital area clean at lowest cost and also sweeps several additional feet of street.

- Because of its simplified design Byers White Wing costs less to buy.

Because of its operating economies it costs less per-curb-mile of sweeping.

Because it has dependable, automotive type construction throughout, completely eliminating pulleys, belts, sprockets and chains, conveyors, complicated controls, etc., Byers White Wing costs less to maintain and keep going.

Every city with 10 miles of paved street can use the White Wing to good advantage. Write today for new illustrated catalogs.

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THE *Original* MODERNIZED POWER PICK-UP STREET SWEEPER

Street Paving and Financing

A NEW D2 DIESEL TRACTOR WORKING WITH A CATERPILLAR BLADE MAINTAINING CITY STREETS IN EAST PEORIA, ILL.

A Gas Tax Truce in Washington

MUNICIPALITIES and highway user groups in the state of Washington have come to a truce in the matter of the use of the proportion of the state gasoline tax revenue allocated to municipalities. At a special convention of the Association of Washington Cities on June 30, it was voted to withdraw the initiative petition calling for the allocation of 20 per cent of the state's gasoline tax revenue to cities.

The highway user groups, represented by the Washington State Good Roads Association, the Washington State Grange, the Washington Division of Highway Users Conference, and the Automobile Club of Washington, have agreed to support legislation allocating 15 per cent of the net gasoline tax collections to cities and towns and permitting the expenditure of up to 30 per cent of the 15 per cent on maintenance.

In a letter to the Association of Washington cities confirming the understanding, the highway user groups stated:

"We cannot agree that the cities should spend their allocation of gasoline tax funds except under the control of the Highway Department of the state, and it is our contention that this control should be analogous to that exercised by the Federal Government over the Federal aid road moneys allocated to the state, but we do agree in cooperation with your Association and with the Director of Highways to use our efforts to make the control procedure as simple as possible and so that the allocation of actual cash to the cities shall be made as expeditiously as possible."

Cypress Strips Used as Expansion Joints

AN unusual method of providing expansion joints in city concrete paving has come to our attention in Tallahassee, Fla. In a 6-inch concrete pavement on a sand-clay base, ¾-inch expansion joints were laid flush with the pavement, using No. 2 cypress painted with creosote. The joints were placed every 40 feet in pavements varying from 24 to 30 feet in width.

These joints have been in service for 7½ years and are just beginning to show some raveling on the heavier traffic streets, but practically none on the residential streets having the usual traffic of that section of a city. The joints will eventually be poured with asphalt up to within ¼-inch of the top of the joint as the cypress wears out and is completely removed from the joints, according to Miller Walston, City Engineer.

Coming Important Paving Conferences

Montana National Bituminous Conference
Edgewater Gulf Hotel, Biloxi, Miss.
October 10-13, 1938

The Asphalt Conference
Biltmore Hotel, Los Angeles, Calif.
February 20-24, 1939

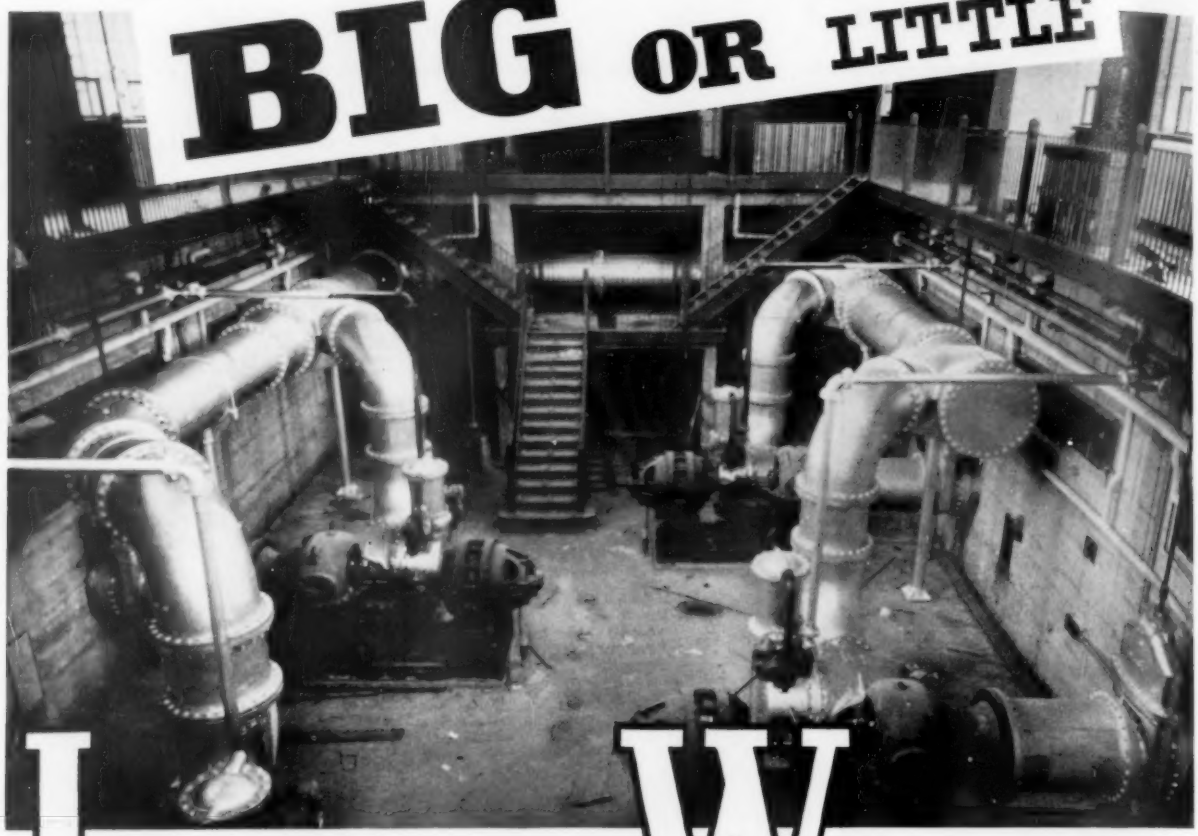
NEW COMBINATION TRUCK PROVIDES MULTIPLE SERVICE FOR BUREAU OF PUBLIC WORKS, HARTFORD, CONN.

This streamlined heavy-duty White Model 702 truck is equipped with a Universal Auto-Eductor for cleaning street catch-basins, and the compartment dump-body of the Eductor unit is used for hauling sludge

A DIESEL AUTO PATROL SPREADING CRUSHED ROCK FOR RESURFACING MAIN STREET, WATERVILLE, WIS.

This No. 11 motor grader owned by M. E. Nelson Construction Co., of Tonasket, Wash., worked 21 hours a day on 2½ gallons of diesel fuel at a cost of 8 cents per hour for fuel

BIG OR LITTLE



Look to Warren

on special piping problems

Your inquiries invited on **SPECIAL CASTINGS**

The above view represents only a small portion of a successfully completed contract, involving 650 tons of flange material from 2" to 72" diameter.

Stock patterns from 2" to 84"—larger, if necessary—can be changed to suit your requirements.

Let WARREN engineers solve those perplexing piping problems for you.

Bell & Spigot and Flange Pipe & Fittings for

Water Works — Sewage Treatment Plants
River Crossings — Mechanical Joints
Gas manufacture and distribution
Gray and Alloy Iron Castings—medium and heavy weight

WARREN FOUNDRY & PIPE CORP., 11 Broadway, New York
Warren Pipe Co. of Massachusetts, 75 Federal St., Boston, Mass.

Sewers--Sewage Works--Pollution

Sewer Cleaning and Rentals in Reading, Mass.

LATE in the fall of 1937 the Sewer Department of Reading, Mass., acquired a new turbine sewer-cleaning unit, which was badly needed. Since the sewer system was installed in 1921, no equipment had been owned by the Department to clean the sewer mains efficiently. As a result of this lack of equipment, and also because, on many sewered streets, the number of houses that were connected did not discharge enough flow to thoroughly flush the main trunk sewers, which were designed to flow two-thirds full when carrying a maximum capacity, or the lateral and sub-mains, which were designed to flow one-half full, sewage solids had been deposited and left in the mains, which tended to clog certain sewers having but a slight grade. One 8-inch trunk sewer became clogged and stopped in February for this reason and was cleared only after much effort.

Immediately after receiving the sewer-cleaning equipment, a program was begun to clean all sewer mains in the entire system which had shown any tendency to clog. Already many of the sewers on flat-graded streets have been cleaned, and the work was continued through the winter if weather permitted.

Twenty-two house sewer connections became clogged during 1937 and were rodded and cleared. Roots and poor joints were responsible for four of the stoppages, and insoluble foreign matter for the remaining eighteen.

In view of the fact that the prevailing sewer-rental rates were such that the larger users of sanitary sewers such as laundries, industrial businesses, etc., found them burdensome, a new schedule reducing the sewer-rental rates was adopted by the Board and put into effect as of April 1, 1937. These new rates, while aiding the larger users, also lower the rental rates for the average user and are as follows:

First	3,000	cu. ft.	@	.23c	per 100	cu. ft.
Next	3,000	" "	@	.20	" "	" "
"	4,000	" "	@	.16	" "	" "
"	10,000	" "	@	.12	" "	" "
"	10,000	" "	@	.08	" "	" "
"	276,000	" "	@	.04	" "	" "
All in excess			@	.02	" "	" "

With the reducing of sewer-rental rates in 1937 and the reduction of sewer-entrance charges in 1929, substantial savings were possible to owners of estates wishing to connect with the common sewer. It is significant that in 1937 all new houses erected on streets containing a common sewer were connected to the sewer. In most instances, the yearly cost of maintaining a private cesspool was greater than the sewer-rental charges.

The Sewer Department has recommended the acceptance by the town of Chapter 280 of the General Statutes of Massachusetts, whereby persons having available to them a common sewer should, as a matter of convenience and community health, connect with the sewer.

Sewage-Works Costs in Cleveland and Buffalo

LIKE Buffalo, Cleveland for a hundred years has been emptying its sewage into Lake Erie, which was also the source of the city water supply. Under pressure of the State Board of Health, with the aid of a $3,000,000 Federal loan, the city has recently completed three treatment plants at a cost of about $25,000,000. In addition, there are large intercepting sewers along the lake shore into which the main sewers empty and which convey the sewage to the treatment plants. It is expected that when the system is once in full operation, besides the improved quality of the water supply, the lake shore will gradually become usable for bathing purposes.

The annual charge upon the community benefited by this improvement, including the cost of new construction and old sewer maintenance ($150,000), as now estimated, is shown below, with the statement for Buffalo. It is expected that Cleveland will collect a part of its annual charge from suburban communities, and this is deducted in computing that city's per capita charge:

	Cleveland	Buffalo
Cost of plant	$25,000,000	$15,000,000
Operation; maintenance.	1,569,500	1,000,000
Debt principal; interest.	1,250,000	500,000
	2,819,500	1,500,000
Less suburban charge	383,175	.....
	2,436,325	1,500,000
City population (1930).	900,429	573,076
City, per capita:		
Operation; maintenance	$ 1.46	$ 1.75
Debt principal; interest	1.25	.87
Total	$ 2.71	$ 2.62

Cleveland is bearing a proportionately heavier load of its cost for capital, because Buffalo obtained a Federal grant and Cleveland obtained only a loan, the comparison being:

	Cleveland	Buffalo
Federal loan	$ 3,000,000	$ 8,250,000
Federal grant	.....	6,750,000
Local money	22,000,000	.....
Total	$25,000,000	$15,000,000

The Cleveland plant is owned and operated by the municipality through its Department of Public Utilities, and not by an independent Authority as in Buffalo. It proposes, therefore, to charge the debt service against the general fund of the city and the remaining annual cost to the water users based on the amount of their water bills. The net water revenues for the past three years of the two cities have averaged: Cleveland, $2,877,194; Buffalo, $2,299,251. The assessed valuations of the two cities are: Cleveland, $1,168,927,138; and Buffalo, $965,454,780. Consequently, to obtain revenues to meet their annual charges for their sewage treatment, the cities will collect the following additional amounts from their taxpayers and water users:

City	Addition to Water Bills	Addition to General Taxes
Cleveland	50%	$1.07 per $1,000 A. V.
Buffalo	40%	$0.73 per $1,000 A. V.

It is estimated that 88 to 90 per cent of the water pumped into a water distribution system goes back into the sewers as waste. It seems proper, then, if there is to be a sewer charge, that it be allocated in part on the basis of water use. Strictly, it should be charged to the consumers in proportion to the quantity of water used, but as these data are not available in cities not fully metered, the water bills are taken as an approximate measure. To charge the whole cost as general property taxes would be obviously unfair, and unduly favorable to water users. That such is the general opinion is evident by the authorization of the water-bill addition by the legislatures of 35 states and its adoption by 350 municipalities which have sewer rentals.

—Published by the Buffalo Municipal Research Bureau, Inc.

Stream Pollution by Waste Steel Liquors

ONE of the outstanding problems of the iron and steel industry is to prevent stream pollution by waste liquors from such operations as pickling, in which the metal is commonly acid-treated. This industry, after endeavoring to solve the problem for many years, at heavy expense, has recently founded, through the American Iron and Steel Institute, a fellowship at Mellon Institute of Industrial Research in Pittsburgh, Pa., aiming to acquire new ideas and to determine a definite solution as soon as possible. The object of the investigation will be to treat or process the waste liquor of pickling plants so as to render it entirely safe for discharging into streams, recovering from it chemicals from which useful products can be made economically. Thousands of tons of iron and sulphuric acid are now wasted annually in various districts of this country through lack of a suitable method of treatment, especially a procedure that can be employed on the large scale necessary in big mills.

The investigation is in charge of Prof. Willard W. Hodge, who has been granted a year's leave of absence by the Department of Chemical Engineering, West Virginia University. He is well known as a specialist in the recovery of by-products from industrial wastes, proper disposal of trade effluents, water purification, and control of stream pollution.

ELEMENTS of PUBLIC SAFETY

GAMEWELL

Fire Alarm

VITAGUARD

For

Volunteer Fire Departments

Despite the great individual fire losses in large cities which frequently run well into millions of dollars, approximately 70% of the annual fire loss occurs in communities of less than 20,000 population. In other words, more than two-thirds of the fire loss occurs in the communities largely dependent upon volunteer fire fighters.

The Vitaguard Fire Alarm System, with its associated public alarm equipment — designed to last for a quarter century—is Gamewell's latest contribution to public safety in cities having volunteer firemen. All elements are extremely simple in design, yet the operation after the initial manual act of pulling a box is entirely automatic, and *directs the firemen to the location of the fire.* The price is within the means of any community.

Police Signal

Write for description and estimates

THE GAMEWELL COMPANY

NEWTON UPPER FALLS MASSACHUSETTS

Public Safety

Keeping 'Em On the Road

THE dangerous locations that exist somewhere in many cities, and on most highways, have a way, sooner or later and sometimes frequently, of being the sites of accidents in which the vehicle leaves the roadway. The Tuthill Spring Co., of Chicago, Ill., manufactures a device to deflect cars and keep them on the street.

"We installed some Tuthill guard-rail on a road that winds over a steep hill," says John H. Barth, City Engineer, La Crosse, Wis. "The installation is satisfactory, as we have had no accidents reported of automobiles going off the road and rolling down the hillside."

Robert M. Benell, City Civil Engineer of Moline, Ill., also describes an interesting application at 55th Street and River Road. "As you enter the city at this point," he says, "you come in on a long sweeping curve which parallels the river. As most of the heavy, through traffic comes in on this avenue, we had to protect it from going into the river. This rail has been up for more than a year and has been hit several times by large trucks weighing in the neighborhood of 10 tons. At times they have dented the guard-rail, but have never demolished it. I cannot recommend it too highly for this purpose. We also use this type of rail with illuminating buttons across the top on dead-end streets to good advantage."

WALKWAY ON WALNUT STREET BRIDGE, CHATTANOOGA, TENN., PROTECTED BY TUTHILL GUARD-RAIL

Little Rock's Efficient Radio Motorcycles

ing.

120 Per Cent Proof

By the Associated Press.

LITTLE ROCK, Ark., June 4.—The Little Rock police radio performed 120 per cent perfect yesterday. It broadcast a pick-up order for five alcoholic patients who escaped from the State hospital soon after midnight. Patrolmen picked up and delivered six to the hospital.

DURING the many years that motorcycles have been a vital arm of the police, these vehicles have been developed not only in step with advances in the automotive arts but with a keen recognition of the evolution continually going on in police work.

One of the elements of success from the proper use of motorcycles is the public's recognition of the prompt and efficient service which they permit the police department to render. The mere appearance of a policeman on a motorcycle causes motorists to concentrate on the traffic and safety regulations. A basic value is of course the ease with which these machines can be driven through congestion.

Radio-equipped motorcycles have now given us a faster method of handling automobile accidents and regulating the flow of traffic. They are also available for emergencies wherever they may arise. The Little Rock, Ark., Police Department operates 15 Harley-Davidson motorcycles all equipped with H-D or RCA receivers operating on an intermediate frequency of 2,406 kilocycles. In addition, we have ten squad cars and three trucks equipped with Remler and Motorola receivers.

LITTLE ROCK OFFICER WITH RADIO-EQUIPPED MOTORCYCLE

The efficient service rendered by our police motorcycles and their low operating cost, makes me endorse them 100 per cent in police work.

J. A. PITCOCK,
Chief, Police Department, Little Rock, Ark.

Traffic Work at Yale

WITH the object of determining what length of road is required by the average driver to overtake and pass other vehicles, especially on two-lane roads, Theodore Matson and Dr. Theodore Forbes, of the Yale University Bureau for Street Traffic Research, have this summer taken 1,000 measurements in many parts of the country. Both the human factors, involving the driver passing and the driver being passed, and the engineering or physical factors of the highway, have come under the scrutiny of the two men, who are research associates of the Bureau headed by Dr. Miller McClintock.

Preliminary findings of the studies of passing and overtaking will probably be presented at the meeting of the Institute of Traffic Engineers in October. It is expected that final conclusions and recommendations will be ready for the meeting of the Highway Research Board in the fall.

One of the major activities of the Bureau during the academic year 1938-39 will be the preparation of young engineers to hold responsible traffic positions. The Bureau provides fifteen graduate fellowships through a grant to Yale University by the Automotive Safety Foundation. In addition, the Bureau will train eight young men who have received the Traffic Safety Award made by Alfred P. Sloan, Chairman of General Motors. Courses include "Principles of Street and Highway Traffic Control"; "Problems of Street and Highway Traffic Control"; "Planning and Design of Traffic Facilities."

CUT THE COST OF SAFETY ON ICY STREETS AND ROADS WITH THE MOST EFFECTIVE ICE MELTING CHEMICAL—

ROCK SALT

PUBLIC officials know the danger to modern, high-speed traffic, on ice and hard-packed snow. Great progress is being made toward greater safety. The early method was to apply abrasives alone — but wind and traffic scattered them so fast that they were but partially successful.

The popular method today is to imbed grits in ice and make an "anti-skid" surface. Here Rock Salt is of tremendous advantage. It is an abrasive itself. Its great ice melting power imbeds more grits faster and holds them longer. Many use Rock Salt alone to prevent ice formation or packed snow.

Experts who know how Rock Salt cuts through and undercuts ice for quick crushing by traffic, and easy removal, use Rock Salt to clear pavements entirely. This method cuts the cost of buying, treating, storing and applying abrasives. It eliminates the cost of removing grits from streets and sewers later. It saves so many more lives, so much more property, that officials believe it to be most economical, in the long run, to have bare streets for winter safety.

International Salt Company, Inc., maintains a complete Research Department and a Road Engineering Department. Both have worked in close co-operation with street and road officials for many years. Modern methods for using Rock Salt have been proven by actual and practical tests. All this long and wide experience is offered at no cost or obligation, to street and highway departments, through the International Salt Advisory Service. Write for any information about methods of ice control required by local conditions and circumstances. Write for the book, "Make Icy Pavements Safe."

Pound for pound Rock Salt IS the most efficient ice melting chemical

POUNDS OF ICE MELTED PER POUND OF CHEMICAL — MAINTENANCE COMMITTEE, HIGHWAY RESEARCH BOARD Vol. 13			ADVANTAGES OF SODIUM CHLORIDE AS CALCULATED BY INTERNATIONAL SALT COMPANY, INC.
Temperature Deg. F.	Sodium Chloride (Salt)	77-80 percent Flake Calcium Chloride	
30°	46.3 lbs. of ice	31.1 lbs. of ice	48.9%
25°	14.4 lbs. of ice	10.4 lbs. of ice	38.4%
20°	8.6 lbs. of ice	6.8 lbs. of ice	26.4%
15°	6.3 lbs. of ice	5.5 lbs. of ice	14.5%
10°	4.9 lbs. of ice	4.8 lbs. of ice	2.0%
5°	4.1 lbs. of ice	4.4 lbs. of ice	— 6.8%
0°	3.7 lbs. of ice	4.0 lbs. of ice	— 7.5%
—6.5°	3.2 lbs. of ice	3.7 lbs. of ice	—13.5%

What are the FACTS about icy pavement accidents?

No general statistics on icy pavement accidents are available. The International Salt Research Laboratory compiled, in the winter of 1937-1938, figures on every skidding accident in the east, serious enough to make the newspaper headlines. In 3,542 skidding accidents 413 people were killed, 2,990 injured. In the same period 52 pedestrians were killed by falls and other accidents on ice, and 1,721 more were injured. This was a mild winter, the accidents only those serious enough to make the headlines, and figures are only for states in the northeast. The total toll of icy pavements must be appalling.

INTERNATIONAL SALT COMPANY, Inc.

SCRANTON, PA. *NEW YORK, N. Y.*

Letters to The Editor

A Tax Moratorium on Property Betterments

To the Editor of THE AMERICAN CITY:

The interest you have shown in the advantages of a five-year tax moratorium on betterments to run-down properties, as indicated by your reference to the New York law, on page 87 of your August issue, is encouraging to those who believe that a similar moratorium would be beneficial in other cities. Your readers may be interested to know that *The Hartford Courant* of July 10, and *Freehold* (the monthly magazine of the National Association of Real Estate Boards) for August, made prominent mention of my similar suggestion for an impetus to extensive rehabilitation of run-down properties by the city of Hartford. In my opinion such action by the municipality would be beneficial in at least three ways:

First, employment would be provided for workers in the building trades who need such employment at this time;

Second, this action would result in large purchases of materials, providing dealers with greater volume of business and, at the same time, help all classes of labor engaged in the production and manufacture of such materials; and

Third, provide better housing, without municipal or Federal subsidy, for the tenants who would occupy these properties after improvement, as well as better business buildings, benefiting both tenants and owners.

AUBREY MADDOCK,
Realtor.

Hartford, Conn.

School Accommodations for Trailer Children

To the Editor of THE AMERICAN CITY:

In THE AMERICAN CITY for August is a valuable article on "Regulating House Trailers and Camps." In the Detroit area we have an excessive volume of trailers which furnish a perplexing problem.

The article by Mr. Klein does not discuss the question of attendance of children in public schools, especially in suburban areas. I happen to know of the immense difficulties, financial and legal, which we have been compelled to face here and which will call, no doubt, for laws to be passed next winter by the Michigan State Legislature. The basic problem is that of securing some kind of financial return from parents in trailer camps who remain indefinitely and whose children attend schools indefinitely.

On the assumption, based on American tradition and practice, that all children are entitled to public school facilities, the new question arises: How shall the education of children in trailer camps be financed? If one or a group of trailer cars are assembled for indefinite periods, and the children are sent to attend neighboring schools, should the local communities be forced to accept them without cost, or are there ways whereby their educational privileges and services can be properly financed?

Adjacent to Detroit, in Wayne County, in rural, suburban sections, this problem has appeared in considerable volume. One camp, for example—one of several surveyed by a committee of county officials—contains more than 100 trailers, with wheels removed in many cases, and with the view to occupancy of the land at least for the coming winter season. As many as fifty children are added to the school population of the township or school district.

To the present time the local and county officials have decided only that they will try the coming season to accommodate all school children who come. In one case a portable building, costing about $1,000, will be set up. But the plan also is to go to the State Legislature next January and ask for laws covering this kind of situation.

At present the only costs assessed against trailers in these camps are the fees charged as a rental by the owner of the land, and he pays no school tax commensurate with the services now to be required. One suggestion is that the landowner be assessed, possibly on a graduated fee basis, for each child put into a public school.

W. P. LOVETT,
Executive Secretary, Detroit Citizens League.

Detroit, Mich.

BLAME THE MAYOR!

By HERB B. GEE

If you're "stuck up" with a gun,
Blame the Mayor!
If the street cars do not run
Blame the Mayor!
If your sewer is not laid
If your taxes are not paid,
If the trees give off no shade,
Blame the Mayor!

If you're sore at all mankind,
Blame the Mayor!
If your pants are patched behind,
Blame the Mayor!
If the motorists all speed
And no traffic signs they heed—
Wrecking humans 'til they bleed—
Blame the Mayor!

If the street lamps do not light,
Blame the Mayor!
If the crossings are a fright,
Blame the Mayor!
If the water mains run dry,
Don't give forth a lusty cry—
Step right up and black the eye
Of the Mayor!

An extract from *The Oklahoma Municipal Review*, June, 1938.

Regulation of Roadhouses

To the Editor of THE AMERICAN CITY:

Experience in Guilford County, N. C., has shown that the licensing of tourist camps and roadhouses outside city limits is the most effective way of regulating lawless and boisterous conduct in these places. Other methods of stamping out these abuses, which in some sections were bringing vigorous protests from county citizens, were unsuccessful, owing mainly to the great difficulty in obtaining sufficient evidence to institute padlock proceedings. Consequently, the General Assembly passed a license act in the 1937 session. The act requires a license from the Board of County Commissioners to operate outside the corporate limits of the incorporated cities and towns in Guilford County any tourist camp, dance hall, road house, place of entertainment, hotel, inn, or lodging or rooming house open to travelers or the general public.

Operation without license is a misdemeanor. Applications for licenses must be in writing, and the Commissioners, before issuing a license, must be satisfied that the applicant: (a) is of good moral character; (b) has never been convicted of a crime involving moral turpitude; and (c) has not, within two years prior to application, been convicted of violating state or Federal laws relating to prohibition, liquor control or prostitution. The Commissioners are authorized to promulgate rules for the operation of such establishments, including a requirement for keeping a register of all guests in tourist camps, hotels, inns and lodging houses.

A license may be revoked for violation of such regulations, or if the place is allowed to become a nuisance, or is used for any unlawful, disorderly or immoral purpose. After revocation of a license, the erstwhile licensee may not operate such a business for two years. The Commissioners must give the licensee an opportunity to be heard before revocation, and appeal to the courts is allowed. The following rules were promulgated by the Board of County Commissioners: The licensee shall: (1) comply with all the provisions of the law referred to above; (2) pay one dollar for issuance of license; (3) comply with all state sanitary rules and regulations; (4) keep a register of all guests if licensee is a tourist camp, hotel or lodging house. The Board also requires that before a license may be issued the application must be approved by the Sanitary Officer and Sheriff of Guilford County.

There can be no doubt that the enactment of the statute, and the regulations prescribed by the County Commissioners pursuant thereto, have had a very salutary effect. They have aided the law-enforcing authorities in the performance of their duties, and have likewise been a benefit to law-abiding citizens.

GEORGE L. STANSBURY,
Chairman, Guilford County Commissioners.

Could your city Qualify?

All the advantages your city may have for new industries may go unheeded—if you can't offer clean, softened, iron-free water. For today modern industries *need* conditioned water. Today they go where they can get it.

Yes, and softened water pleases taxpayers. For it cuts down soap and fuel bills. Makes clothes and linens last 25 to 40% longer. And practically ends many costly plumbing repairs. Nation-wide tests show that softening water saves as much as $100. per family per year!

The Permutit Company, world's largest makers of water-conditioning equipment, can help you soften your water, remove iron and dirt and end bad taste and odor. *All* Permutit equipment works economically—lasts a lifetime. Write for free booklets today. The Permutit Company, Dept. G3, 330 W. 42nd St., N. Y.

RELIEF FROM RELIEF PROBLEMS blesses the community chosen for a new factory. Employment for many now idle! More paycheck money for merchants! Less burden on taxpayers! But how can you attract the new factory? The savings offered by conditioned water may be the deciding factor. Investigate Permutit water conditioning today!

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SEPTEMBER, 1938

Vol. LIII, No. 9

The American City

470 Fourth Avenue
New York

35 Cents, $2 a Year

New Filtration Plant in New England Industrial City

Circular Steel Structure Houses Water Filters and Coagulating Basins at Bristol, Conn.

By THEODORE REED KENDALL
Engineering Editor, THE AMERICAN CITY

ACCUSTOMED to conventional rectangular filters and filter galleries, visitors to the new filtration plant at Bristol, Conn., are impressed not only with the novelty of steel construction replacing concrete in the walls, but with the compactness of the entire plant made possible by its circular form. The new 5-mgd plant, built at a cost of $170,000, is located on the western edge of the city adjacent to the five existing impounding reservoirs and the distribution reservoir, and comprises an attractive red brick pump-house, the 118-foot diameter filtration plant, and two circular steel filtered water reservoirs of 400,000 gallons capacity each.

The Pump-House

The pump-house, measuring 26½ x 33½ feet in plan, is an attractive three-story red-brick building with white trim and a slate roof. Inside the structure, on the ground floor, is a wainscoting of buff vitrified brick, above which is 1½-inch cork insulation throughout, making the building in its exposed location easy to heat in winter and keeping it reasonably cool in summer.

In the basement of the pump-house is an oil-fired heater, furnishing steam heat for the entire pump-house, as well as the filter building. Other equipment in the basement includes a small Ingersoll-Rand compressor which maintains 50 pounds air pressure on the high-pressure tank for the accumulator operating the hydraulic valves, of which there are four in the pump-house and twenty in the filtration plant. Two small electric pumps are used to deliver continuous samples of raw and filtered water to the laboratory on the second floor of the plant.

On the ground floor are two 1.25-mgd Worthington centrifugal pumps driven by General Electric 10-hp motors and two 2.5-mgd Worthingtons with 20-hp G-E motors. These are all low-service raw-water pumps, since the sup-

GENERAL VIEW OF THE NEW FILTRATION PLANT AT BRISTOL, CONN., FROM THE WALKWAY TO THE INTAKE GATE-HOUSE IN THE RESERVOIR

In the foreground is the shore line of the reservoir and the two circular 400,000-gallon clear-water reservoirs. In the center and background are the three-story brick pump-house and the circular steel filter building with windows

ply to the city is entirely by gravity from the clear-water reservoirs. Water delivered by pumping to the plant is measured by a Builders Iron Foundry 20 x 10-inch throat venturi meter. A novelty on the ground floor of the pump-house is the operating table for the pumps, which includes four handles for operating the hydraulic valves on the discharge lines of the pumps, and four sets of push-buttons for starting and stopping the pumps. Above the table a Bristol recording gage shows the elevation of water in the clear well. Also located on the first floor below the stairway is an Automatic Primer Co. unit with I-R pump which automatically primes the pumps and also delivers water to the hydraulic accumulator for the operation of the hydraulic valves.

On the second floor of the pump-house, in a room set aside for them, are four Wallace & Tiernan dry feeders, at present used for alum and lime, one of which may be used for the application of activated carbon if necessary. The Wallace & Tiernan solution feed chlorinators, now in a separate chlorinator house on the main line to the city, will be moved to this room and the chlorine applied between the filters and the filtered-water reservoirs. The hoppers of the chemical feeders reach to the ceiling and are fed from the chemical storage room on the top floor of the building. A ¼-ton Yale electric hoist is used in the attic for raising the chemicals from trucks at ground level for storage. Space is available for storage of sufficient chemicals to operate the plant for two months.

A well-equipped laboratory, office, and lavatory are included on the second floor. From this floor a gallery connects with the operating floor of the filtration plant, so that in bad weather the superintendent and plant operators are not required to leave the buildings during their shifts.

Chemical Treatment

Immediately following the application of chemicals at the chemical room, the water flows through pipes to two 2.5-mgd Vogt Aer-O-Mix pumps driven by U. S. Electrical motors, which suck in air and deliver the water and air to two Aer-O-Mix units from which the water flows to a Super-Mix unit where paddles driven by a small Howell motor give a very thorough mixing of the chemicals, air and water before it flows to the two large coagulating spaces.

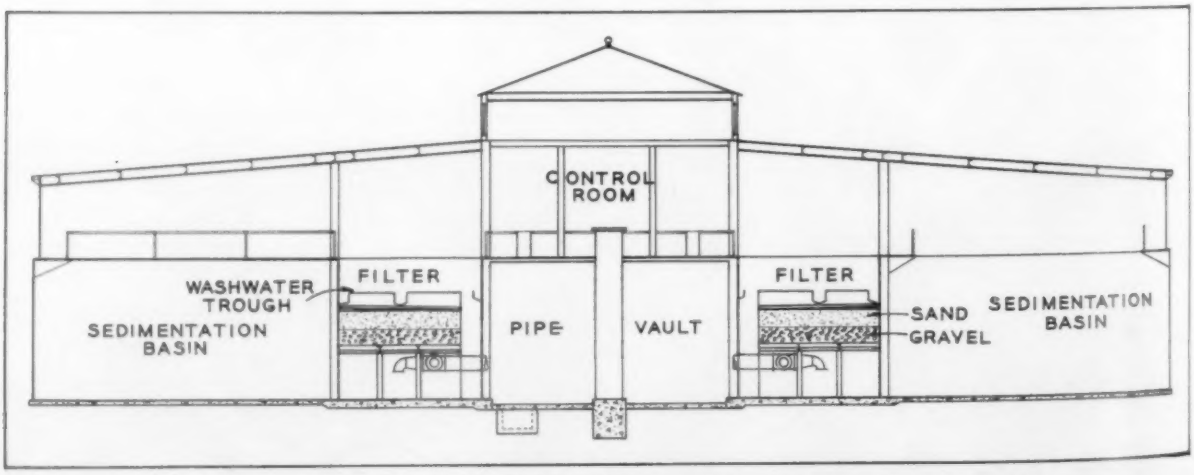
The Filtration Plant

The filtration plant is a circular steel structure 118 feet in diameter, the upper portion of which is well lighted by steel window sash and insulated with 1½ inches of cork insulation, including the ceiling. In the ceiling are 200-watt lights with porcelain-coated metal glass reflectors, giving daylight illumination at any time. The building is heated by four U. S. Radiator unit heaters mounted above the central operating platform and delivering heated air by fans in four directions.

The circular structure is divided into four equal segments by two walkways at right angles. The main walkway runs from the pump-house directly through the plant to an entrance door at the opposite end of the filter building. The second walkway is somewhat narrower and gives access to a peripheral walk permitting inspection of the coagulating basins at any time. The coagulating basins together make an annular ring 31.5 feet wide and are divided into two separate basins by the main walk. The water from the Super-Mix flows into the coagulating basins over influent weirs immediately below the Super-Mix, and around to the far end and over effluent weirs and through a downtake to the filters. Beneath the crosswalk on either side are steel perforated baffles to prevent short-circuiting of the flow through the coagulating basins.

The retention period in the coagulating basins is four hours when both are in service and the plant is operating at the 5-mgd rate. Treated water may be run direct from the Aer-O-Mix to the coagulating basin, eliminating the Super-Mix, if desired. Each coagulating basin is equipped with a 14-inch overflow pipe to prevent flooding in case the pumps are not shut off before the filters are cut out.

The four filters form an annular ring between the circular operating platform and the coagulating basins. The filter influent trough is located against the central pipe vault, and from it lead two radial and three circumferential wash-water troughs. The filters originally had a false bottom composed of a sectional galvanized steel grating with 1¼ x 3/16-inch main bars and ½ x 3/16 cross or tie bars fastened between the main bars. The grating was of the radial type, tapering about 6 inches in the 4-foot 2-inch span between supports. The clear opening between bars was 1 x 4 inches; the tie bars being spaced 4 inches apart and the main bars 1 inch. The bars were flush on



CROSS-SECTION OF THE CIRCULAR FILTER BUILDING OF THE BRISTOL, CONN., WATER WORKS

PROTECTIVE ELEMENTS AT THE NEW FILTRATION PLANT AT BRISTOL, CONN.

Left—The overflow pipes and spillway of the wash-water lagoon as seen from the gravel dike forming the pond. Center—The bridge between the brick pump-house and the steel filter building makes outside trips unnecessary in bad weather. Right—A French drain at the base of one of the clear-water reservoirs

the upper side of the grating. The main grating was divided into three spans of 4 feet 2 inches in each filter with 2-foot spans on either side of the downtake. The adjacent 2-foot 3-inch sections of grating were fastened together with clamps, and could be taken out easily by one man after the clamps had been removed. These original gratings were removed soon after the plant was put into operation, since the sand showed a tendency to shift toward one end of the filter unit when the wash-water rate was increased beyond the rise of about 20 inches per minute. As the cause was not immediately apparent and investigation would have required considerable time, the contractor was permitted to replace the grating support with ⅜-inch steel plate perforated with 17/32-inch orifices approximately 10 inches on centers. Two 1½ x 1½ x ¼-inch steel pieces welded to form a V were inverted and spot-welded over each orifice to distribute the wash water.

Each of the four filters has an area of approximately 439 square feet and has 18 inches of graded gravel on the gratings carrying 24 inches of sand reading to 24 inches below the top of the wash-water troughs. The rate of filtration is 2 gallons per square foot per minute, thus giving each bed a nominal rating of 1¼ mgd, or 5 mgd for the four filters.

Wash water enters the filter below the grating through a 12-inch elbow and two 14-inch pipes. A 24-inch steel manhole in the vertical front wall of each filter permits entrance from the central pipe gallery for inspection of the gratings from the central pipe gallery.

A 26-foot-diameter central platform contains the Norwood hydraulic control tables, on which are mounted Builders Iron Foundry rate-of-flow indicators at the left and recording rate-of-flow and loss-of-head gages on the right.

Pipe Gallery

The pipe gallery, immediately below the central circular operating platform, is reached by a steel ladder and is the essence of compactness. There seem to be less pipe and more valves than one sees in the conventional type filtration plant. Within the small area of this pipe gallery are twenty hydraulically operated Rensselaer valves, as well as the Builders Iron Foundry rate-of-flow controllers and two Worthington 360-gpm wash-water pumps driven by General Electric 5-hp motors.

The filtered water flows from the four filters to a central inspection sight well lined with white tile and with a black and white checkerboard of tile on the bottom around the orifice to the pipe leading to the filtered water reservoirs. The well is illuminated by a large light set in the wall a few feet above the bottom.

Other Features

Two elevated steel tanks of 25,000 gallons capacity each on a knoll to the south of the plant store wash water for the filters. An automatic mercury General Electric switch cuts in or shuts off the Worthington wash-water pumps in the pipe gallery as required to keep the tanks full.

A wash-water pond below the plant was created by throwing up a dike by means of a power shovel and building a concrete headwall containing two 4-inch cast iron pipes and a concrete spillway 3 feet above the pipes. All wash water is discharged into this pond or lagoon, and the water percolates through the gravel overnight.

Twelve inches of coarse gravel with a tile drain at the bottom is laid on the outside of all the steel structures in this plant to a maximum depth of 3½ feet at the two 400,000-gallon clear-water reservoirs. These two tanks are 80 feet in diameter and hold a maximum 10-foot depth

of water. They are interconnected.

The five impounding reservoirs of the Bristol water-supply system have a total capacity of 635,000,000 gallons. The distribution reservoir, from which water is taken for filtration, has a capacity of 78,000,000 gallons. An interesting sidelight on the placing of the new plant in operation was secured in discussing the plant with citizens of Bristol. One enthusiastic individual showed me a glass of water and pointed out how much better the water looked since the new plant was placed in operation. Upon calling this to the attention of the Superintendent, I was told that filtered water had not at that time been delivered to the city. On the other hand, the water-works officials reported that some complaints regarding the water had been received prior to the delivery of filtered water to the city.

The new filtration plant for Bristol, Conn., was designed by James A. Newlands, consulting engineer, Hartford, Conn., and built by the Chicago Bridge and Iron Co. C. Earl Lourie is Superintendent of Water Works. Instead of applying for Federal money for the construction of the plant, the city issued $150,000 in bonds and used $20,000 of revenues for the construction of the plant. The population of Bristol is approximately 29,000, about 27,000 of whom are supplied by the Water Department. K.—790.

If Water Meters Could Talk

*Two Old-Timers Meet Again on the Repair Bench, and Meter 1,790,601 Tells His Story**

By ROGER W. ESTY
Superintendent, Danvers Water Board, Danvers, Mass.

"WHY hello, 1,790,601, where have you been? My! you look as if you've had tough going. Let's hear something about yourself," said meter number 1,790,602.

"Why '602,' you old son of a gun,—gee, I'm glad to see you again. Let's see, its about ten years ago that we came to this place packed snugly in a box with three other pals. I wonder what has become of them? Never mind—let's forget them and talk about ourselves," said meter "601."

These were the remarks of two meters that had come together on a repair bench at the old water-works shop. Ten years ago they had arrived packed in a box to serve in the Department to the best of their ability, and had been checked up, polished and well oiled to do a good job. They had been set on the shelf together for a few days, when one hot summer's day they were both taken off by a short, dark-complexioned man called "Shorty" and laid in the back of the water-works truck and carried away.

One was set in a new house cellar that was light and clean, and that, regardless of the weather, was always dry and warm. That was "602."

"601" *Gets a Bad Berth*

Poor "601" had been carried far away from his pal, for it seemed but ten minutes before the truck stopped again and Shorty, the meter man, grabbed him by the neck, tucked him under his arm, and meandered down the old bulkhead stairs into a dark, cold, damp cellar. There "601" was placed over in the corner, with his ears and feet wired together to do his bit for the Department.

"Well, '601,'" said "602," "let's hear what you have been doing."

"It's a long story, but if we have time before they lug me out again I will try to tell you some of my experiences," replied "601."

"You remember the day we separated, long, long ago? Well, apparently I was placed in a tough place, judging from my appearance when I landed here. You know, I feel better since they gave me a bath and cleaned off the grease and dirt that have accumulated on me recently. A good bath sure peps you up. I've been back here, I should say, about four times.

Rats and Hot Water

"Well, they set me in a dark old hole in the corner and, believe me, it was lonely there. Daytimes it would lighten up a bit, and a little sun came in through a small window for a few hours. That cheered me up. At night it was lonely, but some nights I would have company. You know where the pipe comes in through the wall,—well, there was a sizable hole left there, and you know some nights a lot of little hairy creatures would come in and run all around and all over me.

"I heard the old woman who used to come down and get some potatoes out of a big barrel near me say, 'Those darn old rats are back again. They are eating up me potatoes.' That's how I learned what they were. There used to be a big fellow who came out and sat on top of me while the little ones scampered around. When they would run some water through me I made such a noise they would all run like mad for the hole in the wall again.

"Well, cold weather came, and the old heating plant sometimes ran and sometimes it didn't. One day they forgot it, and it got so blamed hot that I felt myself getting warmer and warmer until I suddenly got piping hot; in fact, so hot that I swelled so much I couldn't move. For days and days, there I was. I couldn't move and I felt so swollen I thought I would bu'st.

"One day Shorty came in to see what I was doing and how I was performing. I guess I was not doing so good, because he untied my ears and legs and took me out and threw me into the back of the truck. Back on the bench they started an autopsy on me and, believe me, they took me all apart. They said that my insides had all swollen up from getting too hot from the hot water. They said that the heart of the machine was gone and needed a new one.

* The characters and situations in this article are wholly fictional and imaginary, and do not portray and are not intended to portray any actual persons or parties.

"Well, they gave me a new heart, fixed up my joints with some rubber collars they call bearing points, and put me together again, and didn't I feel swell! I was just raring to go again, so back I went to the old grind.

The Cold and Grippe Get to "601"

"About two years after that episode the folks upstairs went away and left me all alone. It was even too cold for the rats, and they left too. The nights were long and cold. I just couldn't seem to keep warm. I got colder and colder. The wind, she blew in around me, and the snow blew in through the window over me. Finally I had another terrible time. I seemed to have that swelling sensation again, only this time I was cold and the other time I was hot.

"I seemed to swell more and more, and how my sides ached, until I felt I couldn't stand it another second, when two of my legs snapped off—and where they went to this day I haven't seen them. That helped me tremendously, but I started to cry from the pain, and my tears gushed out for several days. I cried so much that I almost covered myself with tears, and it must have made twelve inches deep all over that cellar.

"Finally the folks came home and came down cellar and I could hear them say, 'Holy smoke! The meter has bu'sted and it's flooding the cellar!'

"Well, up came Shorty again, and back for another ride to the old shop. This time they fixed me up quickly, and after putting on new legs I felt as good as new. Shorty took me back again and set me in the corner. This time he put a coat on me. It's a corker. I don't know how I can describe it, but he placed a wire netting around me and then packed in some white soft stuff all over me. He pulled the top up around my neck just leaving my head out. Boy, I sure have been warm ever since. He called it a 'mitten,' but I still call it my overcoat.

"601" Falls Among Thieves

"You know—I think those folks upstairs are crooked or something. There was an awful rumpus down there lately. That is one reason why I'm back here again, I guess. Well, one night the old woman's man came down stairs and came over into the corner and placed a lantern near me and said, 'I'll ring your neck this time—I'll fool those birds —they can't fool me.' I couldn't imagine what was going to happen. Well, he took off my coat and laid it to one side. Then he took the wire that went through my ear too, I guess they call it a lead seal, and then he kept pushing and pulling that wire back and forth until it finally came out. He slipped it out of my ears and feet and laid that to one side. I just couldn't imagine what he was going to do. I said to myself, Oh! Oh! another autopsy.

"He took my cap off and looked at my face. He started to make me run backwards, in fact, I did it so long I got terribly dizzy. I guess he was dizzy too, for he moved me first backwards and forward. Finally he placed my face back on, put on my cap and wired up my ears and feet again. He slipped the wire through the lead and bent the wire over. He put my coat on again and laced it up and slipped off upstairs.

"Well, you know Shorty is a clever fellow—you couldn't fool him much. I could hardly keep a straight face when he looked at me and counted me up the next time he came. You know he uses a different language than those people upstairs. I could only understand one-half of what he said, but was he getting hot!—You know, I thought he would have the same trouble with his heart I had with mine.

"Shorty came back later and took me out and put in '777' in my place, and here I am getting all fixed up again. I have had a bath and—by the way—this rouge they have put all over me I think is so becoming. I do hope I'll have some of your luck and will be placed in a nice home."

Au Revoir

About that time Shorty came along and grabbed up 601's pal—602, and started off. 602 hollered, "Sorry I can't tell you some of *my* experiences, but if we ever meet again perhaps I can tell you a lot too."

"So long, old boy, see you again," said 601, as 602 disappeared down the stairs under Shorty's arm.

The March of Time in Safety

IN MAY of this year, Milwaukee under direction of the Safety Division, Milwaukee Association of Commerce, held a Silver Jubilee Safety Pageant to celebrate the founding of the national safety movement in this city twenty-five years ago.

National champion drill team displays, gymnastic exhibits, and band playing were part of the pageant in which 250 persons took part, and which 6,000 people came to see. The theme of the pageant was "The March of Time in Safety." The feature spot in the main arena of the auditorium was the "Safety Clock" with its intermittent five-minute chime representing one life loss in America. This forceful message was brought to a climax with the emphasis on the loss of 24 lives during the two-hour pageant program. Honor guests on this occasion were D. D. Fennell, President, and William H. Cameron, Managing Director, of the National Safety Council.

This celebration was the concluding event of the eighteenth annual Milwaukee Foremen's Safety School, which was the first, and is the largest, project of its kind in the country, with a registration this past year of 8,800 supervisory employees who received a three months' training course in the fundamentals of foremanship and industrial safety.

Milwaukee has two other free evening schools which teach the principles of accident prevention and safety: the School of First Aid and Health* and the Fire Prevention School. Fourteen thousand men and women, representing 400 industries, have attended the courses during the past 12 months.

As a result of the work of these schools and a general continuous drive for safety, Milwaukee has been able to bring about a very significant reduction in its fatality rate. Its industrial casualties during the past year were 36 compared to an expectancy of 98 based on national averages. Accordingly, 62 lives were saved in industry. In like manner its motor vehicle, public and home fatalities were but 42 per cent of the national expectancy, with a total life saving of 329 persons. This saving in lives means also a saving in money which more than pays for any costs of the safety program.

Milwaukee business, through its Association of Commerce, estimates that this safety training program brings about an annual monetary saving to business of approximately $1,750,000 in reduced accident compensation and fire insurance rates.

* See THE AMERICAN CITY, June, 1938, p. 89.

Cities Looking into Cost Accounting

Courtesy of Burroughs Adding Machine Co.

The usual plan in municipal cost accounting is to set up a unit ledger account for each item of cost for which a separate accounting is desired. To this is posted by machines such as shown above and below the charges and credits affecting this account, and a total-to-date is extended following each posting to the account. Although the application of cost accounting to municipalities is still somewhat in its infancy, the same principles which have proved so successful in the commercial field will eventually become just as practical and widely used for city-government purposes

1—City of Louisville, Ky., uses International Business Machines tabulating equipment to keep motor-vehicle costs (as well as for all city accounting).

2—All data bearing on costs and quantities as given on time sheets, requisitions, gas and oil service tickets, are punched into cards, each card carrying a different class of expense against a particular vehicle.

3—The cards can be sorted to show all costs against any vehicle or to summarize a particular cost item for all the vehicles.

4—Knowing these costs not only leads to more economical operation of the cars, but makes it possible to charge correctly the departments using these self-sustaining vehicles.

THE importance of cost accounting and the use of machines to provide prompt and accurate figures was stressed as a neglected factor in developing municipal responsibility and confidence, at a Conference on Municipal Accounting and Finance held this year in Chicago.

For a governmental unit to function as inexpensively as any other agency, said George P. Ellis, Chairman of the A.I.A. Special Committee on Governmental Accounting, calls for cost accounting—not to determine profit, but to determine true cost in terms of the *value* of the service performed.

Two cities of the same size and general characteristics, with the same tax levy, may not be at all comparable on the basis of cost of municipal service.

Until cost finding is developed where it is necessary, the budget of expenditures, and to some extent the budget of revenues, cannot help being more or less guesswork. Full and complete records of revenues and expenditures are essential to any degree of proper budget making and budget control.

Municipal accounting theory and practice have made vast strides in the last twenty years. In the last five years especially, there has been far greater improvement in accounting than ever before. The hope of our popular government rests upon brief, comprehensive, well-coordinated, simply-phrased reports which any intelligent person can understand. When our electorate *understand*, they will exhibit the desired interest in sound procedure.

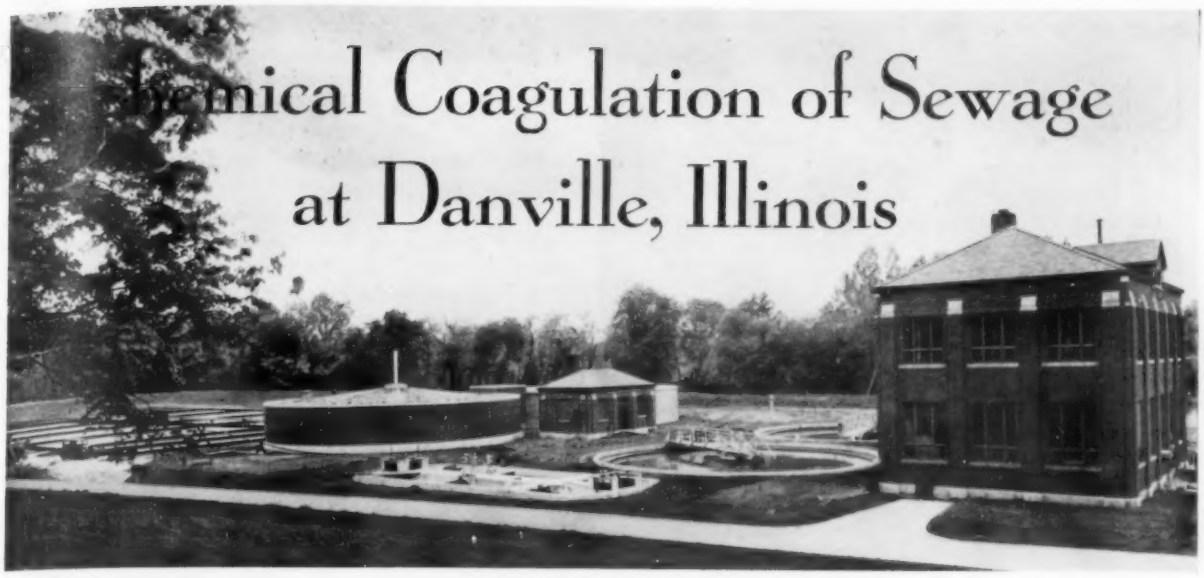
When we speak of municipal cost accounting, said Albert E. Neale, City Auditor, Springfield, Mass., we may just as well drop the word "municipal," for cost accounting is cost accounting whether in government or in industry, cost accounting being that method of accounting which provides for the searching-out and recording of all the elements of costs incurred to attain a purpose, to carry on an activity or an operation, or to complete a unit of work or a specific job.

Where can cost accounting be used in our municipal set-up? It can be used for practically all major operations of municipal government; public works, utilities, education, welfare, health, police, fire, recreation, and others for which a work unit can be established. Here are some of the functions in a public works department alone which can be subjected to cost accounting:

Street cleaning
Snow removal
Ashes and refuse collection and disposal
Construction work—highways, sewers, sidewalks and curbing
Maintenance work—highways, sewers, sidewalks and curbing
Installation and maintenance of street signs, traffic signals, traffic lines, fences
Cleaning of sewers and catch-basins
Operation of asphalt plant, municipal garage

Two factors that should be considered in connection with cost accounting are centralized purchasing and stores procedure. Centralized purchasing provides a method whereby all materials, supplies and equipment used by the various departments of a municipality will be purchased by one central authority. Stores procedure requires the establishment of stores ledgers and perpetual-inventory systems, thus establishing the same kind of control of material that is now applied in cash. The receipt and disbursement of cash is fairly well safeguarded. The receipt and disbursement of material must have the same safeguards.

Chemical Coagulation of Sewage at Danville, Illinois



By PAUL HANSEN

Greeley & Hansen, Consulting Engineers, Chicago, Ill.

ILLINOIS is one of the most progressive states in the country in the matter of sewage disposal. It is probable that the state was first made sewage-disposal conscious by the large undertakings of the Chicago Sanitary District. When the problem of improved sewage disposal became acute in Decatur in 1914, it was found that the constitutional limitation on bonded indebtedness prevented the city from raising sufficient funds. To finance the Decatur project, the local officials introduced a bill in the Legislature authorizing the creation of sanitary districts applicable to all cities. This bill followed more or less closely the thoroughly tried act creating the Chicago Sanitary District, but differed from the latter in one important particular; namely, the Board of Trustees, instead of being elective, was made appointive by the county judge of the county in which a district may be located. The bill was enacted into law in 1917 and has since been known as the Sanitary District Act of 1917. It has proven workable and has been used extensively throughout the state. In all, there are 22 sanitary districts that have been created under the Act of 1917. The method of appointing trustees has kept the activities of the district out of politics and, generally, the personnel of the various boards is of exceptionally high character.

The sewage works that have been built by these sanitary districts from time to time present an interesting picture of the development of the practice of sewage treatment, the application of varying processes to fit local conditions and, perhaps most interesting of all, the reliability and economy of processes in use at the time the Sanitary District Act was passed. There have, of course, been great changes in the design and appearance of sewage-treatment works, so that works built today are quite different in appearance from those that were built during the early part of the period. The improvements in operating control and improvements in economy have been worth while, but they have not been great enough to cause any of the works to become obsolete.

Plants in Other Sanitary Districts

To illustrate developments in Illinois, and as a background to a description of the Danville plant, there will be outlined very briefly the types of works built by the several more important sanitary districts created under the Act of 1917, in the order of their formation.

The Decatur Sanitary District was formed in 1917 and built a plant comprising as main features grit chambers, Imhoff tanks, trickling filters, and final sedimentation. As this plant was required to handle a relatively strong corn-products waste, the process was later supplemented by aeration, between Imhoff tanks and trickling filters.

The next sanitary district to build works was created in 1921 to include the cities of Urbana and Champaign, where the University of Illinois is located. The installation there comprises Imhoff tanks and trickling filters, with final sedimentation of the trickling filter effluent in a

MECHANICAL DEVICES FOR CLEANING THE GRIT CHAMBER OF THE DANVILLE, ILL., SEWAGE-TREATMENT PLANT

INTERIOR OF THE SEWAGE-TREATMENT WORKS AT DANVILLE
Comminutor in right foreground, gates controlling flow to grit chambers in center. The grit chambers extend beyond the end of the building

lagoon. Later, a final sedimentation tank with mechanical sludge removal was installed to remove humus in the filter effluent before passage through the lagoon.

The Elgin Sanitary District was created in 1922. The treatment works included, as main features, devices for grease removal, Imhoff tanks, trickling filters, and final sedimentation basins, with mechanical equipment for removal of sludge.

The Bloomington Sanitary District was created in 1919 but delayed construction until 1926. The treatment works installed comprise Imhoff tanks, trickling filters and final sedimentation tanks.

The Aurora Sanitary District, created in 1925, installed a plant comprising grit chambers with mechanical means for removing grit, sedimentation tanks with mechanical devices for removing sludge, separate sludge digestion tanks, and trickling filters.

The Springfield Sanitary District was created in 1924 and built a plant comprising grit chambers, sedimentation tanks with mechanical equipment for removing sludge, separate sludge digestion tanks with floating covers, and final sedimentation tanks also equipped for mechanical sludge removal. Shortly after this plant was installed, the gas was utilized in gas engines, which served to generate most of the power needed at the treatment works. The works were later doubled in capacity, the additions following substantially the original designs.

The Galesburg Sanitary District was established in 1924 and built treatment works in 1931 comprising mechanically cleaned screens, sedimentation tanks with mechanical equipment for sludge removal, trickling filters, and final sedimentation tanks also with mechanical equipment for sludge removal.

The Peoria Sanitary District was created in 1927 and built works comprising sedimentation tanks equipped with mechanical devices for sludge removal, sludge digestion tanks equipped with mechanical devices for stirring the sludge, sludge storage tanks, aeration tanks using activated sludge, an experimental trickling filter unit with revolving distributors, and final sedimentation tanks. Later, gas engines were installed to generate power for operating air blowers and for pumping the sewage.

The Rockford Sanitary District, created in 1926, built a plant comprising grit chambers with mechanical removal of grit, sedimentation tanks with mechanical removal of sludge, sludge digestion tanks with fixed dome covers, and sludge storage tanks.

The Bloom Township Sanitary District was formed in 1925 and includes the city of Chicago Heights and neighboring built-up areas. This district completed a plant in 1936 comprising preliminary sedimentation with mechanical removal of sludge, one separate sludge digestion tank with gas holder cover, one sludge storage tank without cover, aeration tanks utilizing activated sludge, a final sedimentation tank with mechanical removal of sludge, and gas engines for operating blowers.

The Danville Sanitary District Project

The last of the larger sanitary districts to be formed under the Act of 1917 is that at Danville, in 1935. This district has just completed a treatment plant comprising sedimentation, assisted at times by chemical coagulation. This represents a revival of a process that was in more or less extensive use during the 1890's and in the first five years of the present century. At that time the principal coagulant used was lime. The process was generally found expensive and troublesome. Its revival has been made advantageous by two principal factors, namely, (1) greatly improved sludge disposal by means of digestion and subsequent dewatering and (2) the availability of ferric chloride as a coagulant at a low price.

Estimates indicated that chemical coagulation at Danville was not economical as an all-year process. The variation of flow in the Vermilion River at Danville is such that coagulation is not needed all the year. On the average it will be required but about 25 per cent of the time, though in some years it may be required over 50 per cent of the time. The variable cost of the operation, which in turn is dependent on the stream flow, makes it somewhat difficult to establish the annual operating budget, but the saving in construction cost was such as to make the chemical coagulation feature well worth while.

There may be short periods when even sedimentation aided by chemical coagulation may not be sufficient to lower the oxygen demand of the effluent below the oxygen available in the stream. To meet such situations, provision is made for chlorination, so that the decomposition of organic matter in Vermilion River below the effluent discharge may be retarded to keep pace with re-aeration of the water in the stream and increased dilution from tributaries.

The Danville Plant

The Danville plant is picturesquely located in the valley of the Vermilion River, remote from habitations. The plant structures are given a good appearance architecturally without undue elaboration and at reasonable cost. The plant is flexible and is fully equipped for good operating control, including venturi meters, laboratory and equipment for feeding liquid ferric chloride, granulated ferrous sulphate, granulated alum and slaked lime.

Danville has a population of 37,000, but the new sewage-treament plant is designed on the basis of a population of 50,000 and a dry-weather flow of 90 gallons per capita per day, or a total of 4.5 million gallons daily. The pipes

and conduits in the plant will permit ready passage through the plant of 2.5 times the dry-weather flow, or a total of 11.25 million gallons.

The sewage entering the plant passes through a mechanically cleaned screen combined with a Chicago comminutor. All the pumping equipment at the plant was furnished by the Chicago Pump Co. The grit chamber consists of two channels, 36 feet long by 5 feet wide and 5 feet deep, giving a maximum velocity of 1 foot per second when the two channels are used at design capacity.

Chemical Treatment

There are few data as yet on chemical treatment at the Danville plant, inasmuch as chemical coagulation has not been required for any considerable period since the plant was placed in operation, on February 3, 1937. The ferric chloride dose, when used, varied from 73 to 145 pounds per million gallons. This chemical is fed to the sewage by a Proportioneers Midget Pump controlled by a Builders Iron Foundry sewage meter. When lime was also added the dose of this chemical averaged about 185 pounds per million gallons. The present average flow of sewage to the treatment plant is about 3,000,000 gallons daily.

The mixing chamber to which the treated sewage flows consists of two compartments 45 feet long, 20 feet 6 inches wide, with a water depth of 10 feet. The detention period in these two compartments is 15 minutes at a sewage flow of 4.5 million gallons daily. The stirring devices are operated by Link Belt drive.

From the mixing compartment the sewage flows into the sedimentation tanks, of which there are two, each 55 feet in diameter, equipped with Link Belt sludge-collecting devices. The side water depth is 10 feet and the depth at the center pier is 12 feet. The retention period is two hours, when the two sedimentation tanks are in operation at the design flow rate.

Sludge Handling

Sludge is withdrawn from the sedimentation tanks at the rate of about 20,000 gallons per day and contains about 3.5 per cent solids. The sludge digestion tank is 65 feet in diameter and has a capacity of 75,000 cubic feet, or 1.5 cubic feet per capita for a population of 50,000. It is equipped with a Pacific Flush Tank floating cover, and the sludge gas is used for heating the tank as well as for heating the main building in winter. No utilization of gas for power is provided, but this may be taken up later. A separate sludge storage tank of the same diameter and capacity is also provided. The digested sludge is drawn off to 40,000 square feet of sludge beds designed for 0.8-square foot of area per capita for a population of 50,000.

Results of Operation

The following table shows the monthly operating data from July, 1937, through February, 1938, for the Danville plant:

Monthly	Per Cent Reduction from Raw Sewage to Effluent	
	Suspended Solids	5-Day B.O.D.
July, 1937	60.6	40.2
August, 1937	71.9	48.8
September, 1937	83.7	63.6
October, 1937	76.0	62.9
November, 1937	67.0	48.5
December, 1937	64.6	42.6
January, 1938	62.3	47.6
February, 1938	57.8	35.9

The Danville treatment works have been in operation since February, 1936. The plant has been run experimentally with ferric chloride and alum as coagulants. The relative merits and the relative economy of ferric chloride and alum are inconclusive as yet. It has also been found that some flocculation may be obtained without chemicals by passing the sewage through the flocculating chambers, and this adds substantially to the effectiveness of sedimentation. Plain sedimentation effects the removal of about 72 per cent of the suspended solids and 45 per cent of the biochemical oxygen demand. Sedimentation with the aid of coagulants removes about 85 per cent of the suspended solids and about 65 per cent of the biochemical oxygen demand.

Personnel

The Trustees of the Sanitary District during the period of construction were J. E. Epler, President; G. K. Hooton and T. H. Carson. Mr. Epler resigned at the close of the construction period to become Manager of the District. Mr. Carson replaced Mr. Epler as President. George Fox was appointed to replace Mr. Epler as a member of the Board. F. O. Sullivan is Chemist for the Sanitary District. The author is indebted to Mr. Epler for all information relating to operation. Greeley and Hansen were engaged as engineers to design and supervise construction of the treatment works. J. W. Nemoyer had charge of construction work and U. K. Sick was Resident Engineer for Greeley and Hansen. Mr. Sick was assisted by W. M. Fairhall at the treatment plant.

Letter to Taxpayers Accounts for Every Cent of Taxes

TAXPAYERS want to know where their money goes, Mayor Charles R. Erdman of Princeton believes. Accordingly, he has sent out with the current bills, for the third consequent year, his annual letter explaining, with the help of charts and illustrations, how every penny of every tax dollar is spent, and how the tax rate is computed.

"No one likes to pay taxes," Mayor Erdman writes, "but this report on what your money buys is prepared in the belief that an understanding of what you are receiving will somewhat lessen the shock of payment. In fact, we hope you will speed up that payment when you realize that tax delinquency not only adds penalties for yourself but also increases the burden of every other taxpayer."

Besides describing the general local government services which taxes pay for—salaries, streets, recreation, fire and police protection, health, sewage, etc., the letter lists particular achievements of the administration during the past year. These included a reduction in the borough tax rate, the construction of a modern borough garage, the establishment of a venereal disease clinic, and improvements in the Police Department. At the end of the letter the more urgent community needs are enumerated: a community housing program; a planning commission; a pension system for all borough employees; adequate recreation facilities; modernization of property assessments.

One of the most interesting features of the letter, calculated to make taxpayers sit up and take notice, shows the amount of each tax dollar which goes to make up for uncollectible taxes, and for interest on money which must be borrowed because of unpaid taxes.

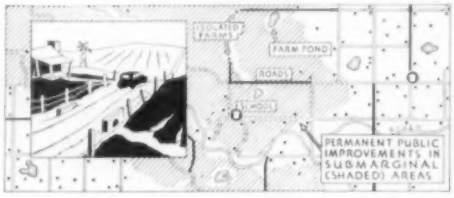
DIVISION OF STATE PLANNING

PUBLIC WORKS PLANNED & UNPLANNED

SOME EXAMPLES OF THE NEED FOR PLANNING

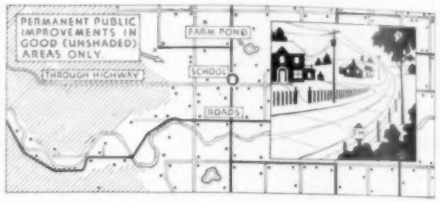
OKLAHOMA 1938

UNPLANNED PLANNED



SUBMARGINAL AREAS

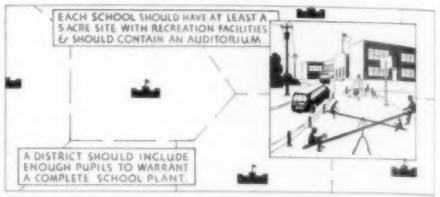
PERMANENT LOCAL PUBLIC IMPROVEMENTS SHOULD BE PLANNED IN ACCORDANCE WITH PROPER LAND USE PLANS & SHOULD NOT BE BUILT IN SUBMARGINAL AREAS WHERE THE PRESENT POPULATION IS NOT EXPECTED TO REMAIN

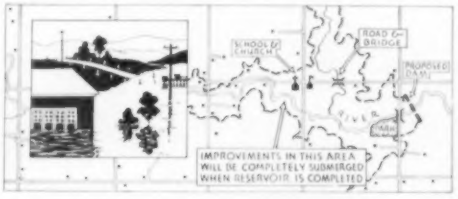


NEW SMALL SCHOOLS TEND TO PERPETUATE AN INEFFICIENT & OBSOLETE SYSTEM
SCATTERED 1 OR 2 ROOM SCHOOLS CANNOT PROVIDE THE SAME FACILITIES AS CONSOLIDATED SCHOOLS

RURAL SCHOOLS

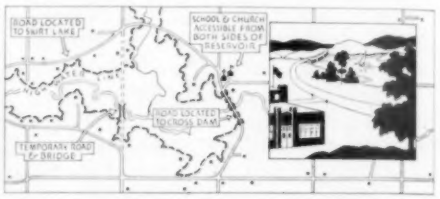
SHOULD BE BUILT IN ACCORDANCE WITH A GENERAL CONSOLIDATION PLAN PROVIDING FOR THE GRADUAL ELIMINATION OF UNECONOMICAL SMALL UNITS AND SHOULD BE DESIGNED AS COMMUNITY CENTERS TO SERVE RECREATIONAL SOCIAL & OTHER COMMUNITY NEEDS


EACH SCHOOL SHOULD HAVE AT LEAST A 5 ACRE SITE WITH RECREATION FACILITIES & SHOULD CONTAIN AN AUDITORIUM
A DISTRICT SHOULD INCLUDE ENOUGH PUPILS TO WARRANT A COMPLETE SCHOOL PLANT


SCHOOL & CHURCH
ROAD & BRIDGE
PROPOSED DAM
IMPROVEMENTS IN THIS AREA WILL BE COMPLETELY SUBMERGED WHEN RESERVOIR IS COMPLETED

RESERVOIR SITES

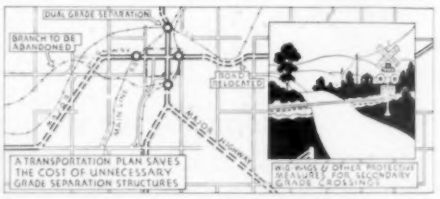
WHERE FUTURE RESERVOIRS ARE INDICATED BY THE STATE PLAN NEW IMPROVEMENTS SHOULD BE LOCATED ABOVE THE PROPOSED HIGH WATER LINE. IF STRUCTURES WITHIN THE LAKE SITES ARE NECESSARY FOR IMMEDIATE USE THEY SHOULD ONLY BE TEMPORARY

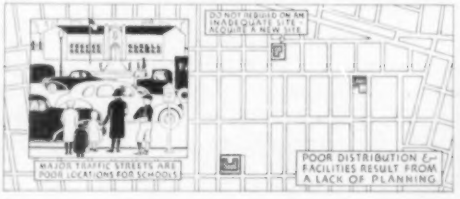

ROAD LOCATED TO SKIRT LAKE
SCHOOL & CHURCH ACCESSIBLE FROM BOTH SIDES OF RESERVOIR
ROAD LOCATED TO CROSS DAM
TEMPORARY ROAD & BRIDGE

GRADE SEPARATIONS AT RANDOM
NO DISTINCTION BETWEEN MAJOR & SECONDARY RAIL & MOTOR ROUTES
COSTLY GRADE SEPARATIONS MAY BE LEFT STANDING BY RAILROAD ABANDONMENTS

GRADE CROSSINGS

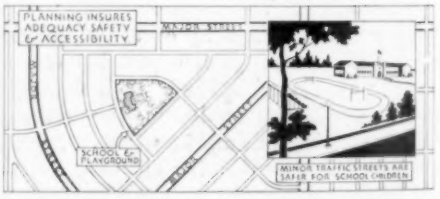
GRADE SEPARATIONS SHOULD BE BUILT IN ACCORDANCE WITH A LONG RANGE HIGHWAY & RAILWAY PLAN. FURTHER EXPENDITURES SHOULD BE AVOIDED WHERE THE PLANNING STUDIES INDICATE A POSSIBLE ABANDONMENT OF THE RAILROAD OR RELOCATION OF THE HIGHWAY


DUAL GRADE SEPARATION
BRANCH TO BE ABANDONED
ROAD RELOCATED
A TRANSPORTATION PLAN SAVES THE COST OF UNNECESSARY GRADE SEPARATION STRUCTURES
WIDE WIDTH & OTHER PROTECTIVE MEASURES FOR SECONDARY GRADE CROSSINGS


DO NOT REBUILD ON AN INADEQUATE SITE. ACQUIRE A NEW SITE
MAJOR TRAFFIC STREETS ARE POOR LOCATIONS FOR SCHOOLS
POOR DISTRIBUTION & FACILITIES RESULT FROM A LACK OF PLANNING

URBAN SCHOOLS

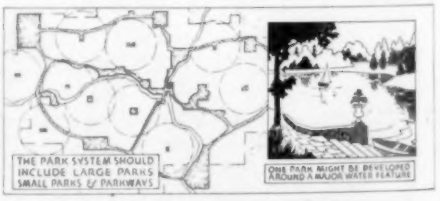
SHOULD BE LOCATED TO CONFORM TO A MASTER CITY PLAN IN ORDER TO AVOID PRESENT & FUTURE MAJOR TRAFFIC STREETS. EACH SCHOOL SHOULD HAVE A LARGE SITE & FACILITIES FOR SERVING MOST OF THE RECREATIONAL & CIVIC NEEDS OF THE NEIGHBORHOOD

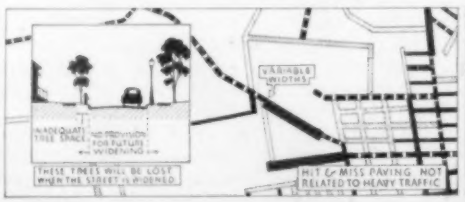

PLANNING INSURES ADEQUACY SAFETY & ACCESSIBILITY
MAJOR STREET
SCHOOL & PLAYGROUND
MINOR TRAFFIC STREETS ARE SAFER FOR SCHOOL CHILDREN

PARKS SHOULD NOT BE CLUTTERED UP WITH TOO MANY FACILITIES
LACK OF PLANNING RESULTS IN DUPLICATION IN SOME SECTIONS WHILE OTHERS ARE UNSERVED

PUBLIC PARKS

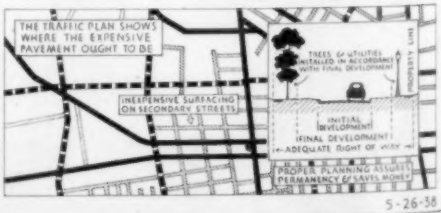
PARK IMPROVEMENTS SHOULD BE MADE IN ACCORDANCE WITH A GENERAL PARK SYSTEM PLAN. EACH PARK SHOULD BE DEVELOPED AROUND SOME DISTINCTIVE FEATURE & SHOULD SERVE A DEFINITE AREA. OVERDEVELOPMENT OF PARKS SHOULD BE AVOIDED


THE PARK SYSTEM SHOULD INCLUDE LARGE PARKS SMALL PARKS & PARKWAYS
ONE PARK MIGHT BE DEVELOPED AROUND A MAJOR WATER FEATURE


VARIABLE WIDTHS
INADEQUATE TREE SPACE
THESE TREES WILL BE LOST WHEN THE STREET IS WIDENED
HIT & MISS PAVING NOT RELATED TO HEAVY TRAFFIC

STREETS & HIGHWAYS

A MAJOR HIGHWAY PLAN SHOULD FORM THE BASIS FOR PERMANENT IMPROVEMENTS. WIDE & HEAVY PAVEMENTS SHOULD BE CONFINED TO MAIN TRAFFIC ROUTES & SHOULD BE CONTINUOUS. THE STREET CROSS SECTION SHOULD ALLOW FOR FUTURE WIDENING IF NECESSARY


THE TRAFFIC PLAN SHOWS WHERE THE EXPENSIVE PAVEMENT OUGHT TO BE
INEXPENSIVE SURFACING ON SECONDARY STREETS
TREES & UTILITIES INSTALLED IN ACCORDANCE WITH FINAL DEVELOPMENT
INITIAL DEVELOPMENT
FINAL DEVELOPMENT
ADEQUATE RIGHT OF WAY
PROPER PLANNING ASSURES PERMANENCY & SAVES MONEY

5-26-38

Long-Term Public Works Planning

Purposes and Principles

LONG-TERM planning is undertaken not to encourage excessive public works, but to guide normal expenditures in accomplishing fuller and better services. Its specific value, when timed for stabilization, will be found in alleviating the problem of the business cycle and the accompanying unemployment; in becoming a permanent balance wheel to counteract the ups and downs of private and public business activity. This is the basis of the entire Federal emergency program, with which municipalities, counties and states may cooperate, obviating the difficulties which small governmental units experience in creating an antidote for periodic unemployment unless individual projects are fitted into a consistent whole.

These principles are tellingly presented in the recently issued report of the Oklahoma Planning and Resources Board, under the Division of State Planning (of which T. G. Gammie is Director), with the title, "Public Works Planning in Oklahoma."* Typical of its application to general discussion is the drawing reproduced on the opposite page under the heading, "Public Works Planned and Unplanned—Some Examples of the Need for Planning." The easily read comment in each case applies respectively to submarginal areas, rural schools, reservoir sites, grade crossings, urban schools, public parks, and streets and highways, and is definite in contrasting the results of unintelligence and neglect with those of farsighted and trained planning.

To realize their highest objectives, public works programs must be based upon the relative usefulness of each project as well as the social and economic background. Adherence to a good plan may avoid such costly mistakes as eliminating grade crossings on minor highways and railroad lines likely to be abandoned; enlarging local public facilities in sections of declining population; building small rural schools in districts affording consolidation; developing public works in areas to be submerged by proposed dams; crowding recreational facilities in small space; constructing major thoroughfares in narrow rights-of-way; and improving secondary roads when major highways are in equal need.

Things to Attain

Turning from things to avoid, the Oklahoma report emphasizes the positive point of view:

"Along with changing types and increasing volume of public works, methods and principles concerning selection have undergone change, and modern thought along this line is as follows:

"1. Every project should serve a definite social need.

"2. Projects should be economically sound; that is, their costs should be in proportion to their benefits.

"3. Projects should conform to city, regional, and state plans and in every case be an integral part of a comprehensive plan in order to reduce complications.

"4. Projects should be considered in relation to other needed public improvements to insure a balanced program of public expenditures.

"5. Projects should serve as economic stabilizers; that is, they should be undertaken at a time when materials are low in price and labor is plentiful."

"If public works are to be used as antidotes to depressions," continues the report, "programs must be kept in constant readiness so that any part or all of the projects which they include can be put into operation upon short notice. These programs cannot be static, but must remain in a process of revision in order to be kept consistent with social changes, new requirements, and technical developments. Plans must also be made for the maintenance of reserve funds, in order to keep them intact during a business decline. Much economic study has been devoted to determining when projects should start and how many of them should be undertaken in order to produce the desired effect."*

Division of Costs

"The variety of types of public works and the services they render have given rise to the problem of division of costs. The costs of public works are borne by the taxpayers, but not in equal shares, since benefits are not uniform and abilities to pay are not the same. Local paving and sewers undoubtedly should be borne almost entirely by the locality served directly, but extensive drainage, flood control, and power projects should be paid for by regions as well as the immediate locality in which they are located."

* See page 117, this issue.

* See: "Criteria and Planning for Public Works," by Russell V. N. Black; "Economics of Planned Public Works," by Arthur D. Gayer; "Economics of Planned Public Works," by J. Maurice Clark; and "Government Organization for Public Works Planning," by F. W. Powell; also "Stabilizing Municipal Expenditures for Permanent Prosperity," in THE AMERICAN CITY, August, 1938, pp. 35-37.

URBAN LAND IN LOS ANGELES COUNTY—USED AND UNUSED

AMONG other interesting features in a report of a Land Use Survey of the County of Los Angeles (a WPA project) transmitted July 13, 1938, to the Regional Planning Commission of that county by William J. Fox, Chief Engineer, is an analysis of land uses in the 314 square miles of urbanized lands in the county. These lands, which constitute all subdivided or distinctly urban areas, including the small towns and villages as well as the metropolitan center, constitute about three-eighths of the whole area of the county.

The percentages of all uses in the 314 square miles of urbanized land are as follows:

Land Used for:	Per Cent of Total Urban	Land Used for:	Per Cent of Total Urban
Residence, single and duplex	30.29	Recreation (public and semi-public). Survey includes only a portion of Griffith Park in Los Angeles City	2.67
Multiple residence	2.05	Streets and highways	25.61
Commerce	2.99	Vacant lots	21.25
General industry and manufacturing	2.59	Vacant land (unsubdivided)	3.47
Oil industry	0.75	Miscellaneous (stream beds, agriculture, cemeteries, etc.)	3.57
Railway purposes	2.00		
Other utilities (airports, power plants, etc.)	0.71		
Schools (including private)	1.63		
Other institutions	0.42		

From the foregoing table it will be observed that *vacant* lots comprise about 21 per cent of the urbanized area. For occupied lots the ratio of residential to business use is about 11 to 1.

Seven Safeguards for Municipal Credit

By FREDERICK L. BIRD
Director of Municipal Service, Dun & Bradstreet, Inc.

NO longer can the average city look to tomorrow's influx of population to lighten its responsibility for financial obligations incurred today. Nor is there much immediate prospect of skyrocketing assessed valuations to make tax levies appear smaller and debt burdens less onerous. Quite to the contrary, the future anticipations of municipal finance must take into account the greater share of the nation's income which will be required by the state and national governments to meet their commitments for social security and debt.

Cities, moreover, if they are to justify their continuing existence as autonomous units of government, must be prepared to assume more responsibilities, do a still better job of administering their present ones, and at the same time adjust their policies and planning to conform with what appears to be a permanently higher level of welfare costs and with the limitations of an imminently static or even declining population. This is by no means an impossible task, but it involves securing more value for each dollar spent, closer adherence to sound fiscal policies, and a greater awareness than is now generally manifest of the nature and magnitude of the long-term problems which municipal government is facing.

All credit is based fundamentally on confidence. Municipal credit is determined by confidence:

1. That a city's obligations fall clearly within its economic resources for payment.
2. That plans for payment have been soundly formulated.
3. That the local government both possesses and uses adequate legal power to draw upon the resources which the community affords.
4. That budget-making and executing policies are designed in the best possible way to keep the current account from becoming involved.
5. That the city's administration is providing the services, the physical facilities and the forethought which are essential to maintaining and perpetuating a livable community.
6. That this is being accomplished with reasonable economy and efficiency.
7. That there is a genuine quality of responsibility and integrity in those who administer and control the city's governmental affairs.

These seven safeguards for municipal credit may sound simple, but they mean much. They do not constitute an exhaustive compendium of all the theories of municipal credit, but they offer a thoroughly practical working basis for building and maintaining credit. In fact, commonplace as these standards appear to be, it is the exceptional rather than the average city which even approximates all of them in practice today; and their full attainment offers a challenge to every municipal official who takes pride in his profession. Suppose we take a brief look at each factor to determine what concrete, guiding principles can be drawn from the recent experience of cities generally.

1.

The fundamental question is how much debt a community can safely incur. State constitutions and statutes and city charters have tried to answer this question, but with generally poor to mediocre success. Some of them have promulgated such disastrous exemptions from the debt limit as special assessment bonds, even when contingent general obligations; and, with one or two exceptions, no safeguards have been set up against the pyramiding of debt by overlapping units of government in a single taxpaying community. Thus what may be ostensibly a 10 per cent borrowing limit may actually become a 30 or 40 per cent limit. With no adequate legal control of public borrowing in the great majority of urban areas, it becomes necessary, for the time being at least, for officials themselves to set their own realistic limits, and with a due regard to all the public borrowing in the area.

What is a safe maximum, gaged by assessed valuation at 100 per cent of full taxable value? From the recent experience of municipalities the country over, certain broad generalizations are possible. Very few municipalities with over-all, net, tax-supported debts in excess of 15 per cent of full taxable value escaped more or less serious default in the depression period. Very few whose over-all debts fell below 10 per cent became conspicuously involved in default, the exceptions being places which encountered violent industrial or banking catastrophes, were managed with gross incompetence, or had defective powers to levy and collect taxes. In the range between 10 and 15 per cent the result depended largely on the stability of the community and the ability of the administration. Tentatively, therefore, a safe maximum appears to be 10 per cent, allowing for sufficient exceptions to prove the rule. These ratios, it should be emphasized, apply to over-all net debt—a city's direct debt and its proportionate share of the debts of overlapping local units, inclusive of special assessment debt but exclusive of the debts of bona fide utility enterprises which are actually self-supporting. They include also those debts incurred for governmental purposes to which governments have tried to give a semblance of business enterprise by imposing some sort of service charge for payment.

It is an item of some interest, in this connection, that last year the median, over-all, net, tax-supported debt of the 190 United States cities of over 50,000 population was 6.8 per cent of estimated full taxable value. That is, half were below this figure, ranging downward to 1.0 per cent, while half were higher, ranging up to 44.9 per cent. Only 37 of the 190, however, were over 10 per cent.

This tentative maximum of 10 per cent is subject to exceptions, however, because taxable valuation is only a very rough measure of the extent and stability of a community's

resources. Suppose that a community does have a tax-supported debt which is conservatively related to resources for payment, what assurance is there that it will stay that way? The best evidence as to future trend rests in four considerations: Is a city's current account so managed as to preclude the probability of deficiency bond issues? Is a city's relief financing arranged to keep new relief borrowing each year within the amount of debt for that purpose retired? What essential physical facilities does the city lack? How adequate are the plans for debt retirement?

The third consideration, the adequacy of physical facilities, has particularly interesting angles. Every outmoded public building, every unsolved major traffic problem, every dilapidated area, and every lack of a modern sewage-disposal system or other community essential represents potential borrowing. No alert analyst of credit appraises a city's debt trend without taking these potentialities into consideration. But what about city managements? Perhaps this can best be answered with another question. How many cities can show as much as a five-year capital budget, engendering confidence that its capital financing program is clearly within its means?

2.

Fully as important as the relation of debt to resources is the second of the seven general credit factors—that *plans for debt repayment must be soundly formulated.* This raises the somewhat intricate and debatable question of what constitutes good debt structure. That this important aspect of debt administration, moreover, has received less general consideration than it deserves, is evident from the facts that faulty debt structure has caused widespread financial embarrassment in recent years, and that hundreds of municipal finance departments have no up-to-date debt retirement schedules as part of their working and planning equipment.

Out of the mass of somewhat conflicting opinion as to appropriate debt structure there emerge several more or less well-defined policies whose general application will go far in preventing future involvements. They are important, because a poorly planned debt retirement program may take years to correct.

The most evident of these policies is the avoidance of abnormal peaks and irregularities in the retirement schedule. They disturb and complicate budget arrangements and create susceptibility to default in depression periods.

The rate of retirement, in the second place, should be as rapid as possible without forcing debt service to absorb too large a proportion of the budget. Recent study of the situation in 100 representative cities suggests that a normal rate of retirement is 25 per cent of outstanding debt in each succeeding five years.

A third constructive policy demands that the service schedule for all outstanding debt be arranged to provide for progressively decreasing annual requirements, the objective, of course, being to provide space for future bond issues without increasing the level of debt service. Small cities, with infrequent bond issues of any size, need to use straight serial bonds to accomplish this. Large cities, with bond issues reaching final maturity each year, can attain the same result with a judicious use of term and serial annuity bonds. So-called "equalization" plans, which provide for an even level of debt service over a long period of years, are misleading arrangements which continue to look beautiful only until the next bond issue is sold.

The one orthodox exception to this step-down plan is in scheduling the retirement of bonds issued for public service enterprises which need time to build up earning power. One other exception which can be condoned, however, arises in refunding to cure default on an excessive debt. At best, however, such deferment of payment is a combination of "breathing spell" and fond hope that resources will catch up with debt at some future date. Now that some of these recently created breathing spells are drawing to a close, we are in line for further education on the subject of debt structure. No consideration of debt structure, it should be emphasized, can afford to ignore the widely differing economic characteristics of cities.

3.

It is pertinent to summarize the present and potential effect on credit, of all legal and administrative limitations to the levy and collection of taxes. These handicaps to credit fall under two general classifications.

Most conspicuous is the tax rate limit and the growth of exemptions from taxation. Sentiment regarding tax rate limits which include debt service is typified by the provision of the Banking Law of the State of New York which declares that no obligation issued after 1938 by any city, county, school district or other municipality shall be authorized investment for the moneys of savings banks unless such units of government shall have power to levy taxes on their taxable real property for the payment of such obligation without limitation of rate or amount.

But rate limits which exclude debt are detrimental to credit if they impose a serious handicap on a city's current operations. There can be no full confidence in the finances of a city with such inadequate powers of taxation that it is unable to maintain standard services, is forced to let physical structure deteriorate, is unable to avoid large deficits which must be funded, is financially helpless when faced with an emergency, and is driven to short-change its debt funds. Illustrations may be cited of cities in this predicament that are engaged in the chronic refunding of bonds to release funds for operating purposes, are refunding bonds only recently refunded, and are refunding unlimited tax bonds in order to lower the tax rate to induce voters to authorize higher special rates for current operations.

The adverse effects of the growth of exemptions from taxation give promise of becoming more damaging as time goes on—particularly in the categories of pseudo-philanthropic organizations with political influence, of large homestead exemptions, and of the interstate piracy for the acquisition of industrial concerns.

Appraisal of a city's credit, however, not only takes into consideration the adequacy of power to levy taxes, but concerns itself with the degree of efficiency employed in their assessment and collection. The vital questions taken into account are the effectiveness of the legal procedures under which local officials must operate, and the administrative ability and energy demonstrated by the officials themselves. Among the factors which engender confidence are laws which sponsor scientific assessment and permit inexpensive and reasonably prompt foreclosure proceedings; assessing which avoids political favoritism and wholesale appeals and rebates; collection periods well synchronized with the fiscal year; and collection methods

which permit installment payments, secure prompt payment through businesslike efforts and effective inducements, and use due diligence in enforcing penalties upon delinquents.

4.

What constitutes a sound current account in the eyes of a credit analyst? Well, if there were in general use a standard system of accounts and a standard system of budget making an execution, that question could be rather easily answered. With conditions as refreshingly varied as they are, however, it becomes necessary to apply tests which have sufficient flexibility to cover the variations.

If a city functions on the policy of cash basis operations, it is a question of ascertaining how well it lives up to that policy, by noting the year-end relation of current liabilities to available cash, the promptness in disposing of casual deficits, and the devices used to keep deficits from acmumulating. If, on the other hand, a city operates on a revenue accrual basis, analysis concerns itself with the adequacy of reserves for uncollectible revenues, and with the liquidity of the current account. A quick and exacting rule-of-thumb test of satisfactory liquidity at the close of any fiscal year requires that cash and the uncollected taxes of the year just closed equal the demand liabilities outstanding.

It is not the outcome of any one year of operations, however, which is the major concern in current account analysis. The important factor is how well and honestly designed are the system and practice of budget making and execution to keep the finances of a city stable, under abnormal conditions as well as under normal circumstances.

Balance sheets and budgets are full of guide-posts for the appraiser, assuring him of a city's safe financial road ahead or warning him of approaching dangerous grades and curves. What are some of the warnings he looks for and frequently finds? Imaginary items in the revenue estimates, such as a 100 per cent expectation from an only 50 per cent collectible personal property tax; phoney assets in the balance sheet to create a paper surplus such as uncollected taxes moss-covered with age; overlays and reserves far short of what the tax collection record shows to be necessary; exhaustion of every nickel of surplus to produce a low tax rate in an election year.

5.

Somewhat akin to the subject of balanced budgets is the fact that there is no inherent sanctity in a low tax rate. Taxpayers' chronic complaints to the contrary notwithstanding, what a city most needs are governmental services and facilities which will make it as efficient a place as possible for the carrying on of production and trade, will prevent it from passing into obsolescence, and will provide safety and health and freedom from exploitation for its people. This is unalterably true from the point of view of sheer economic and social necessity, and it is equally true from the most narrowly hard-boiled credit angle—that a city must perpetuate itself as a going concern if it is to meet its obligations successfully. Herein lies the basis for the fifth general credit standard—*confidence that a city's administration is providing the services, the physical facilities, and the forethought which are essential to maintaining and perpetuating a livable community.*

It is increasingly evident, moreover, that this mandate carries with it an additional responsibility, that of restoring resources and salvaging the wreckage of past disasters. In too many of our cities there is a creeping economic paralysis, its symptoms showing in abandoned subdivisions, loss of industry, and dilapidated and depreciating slum areas. Enough already has been accomplished in the process of reclamation and restoration by certain outstanding capable city administrations to demonstrate its feasibility.

6. *and* 7.

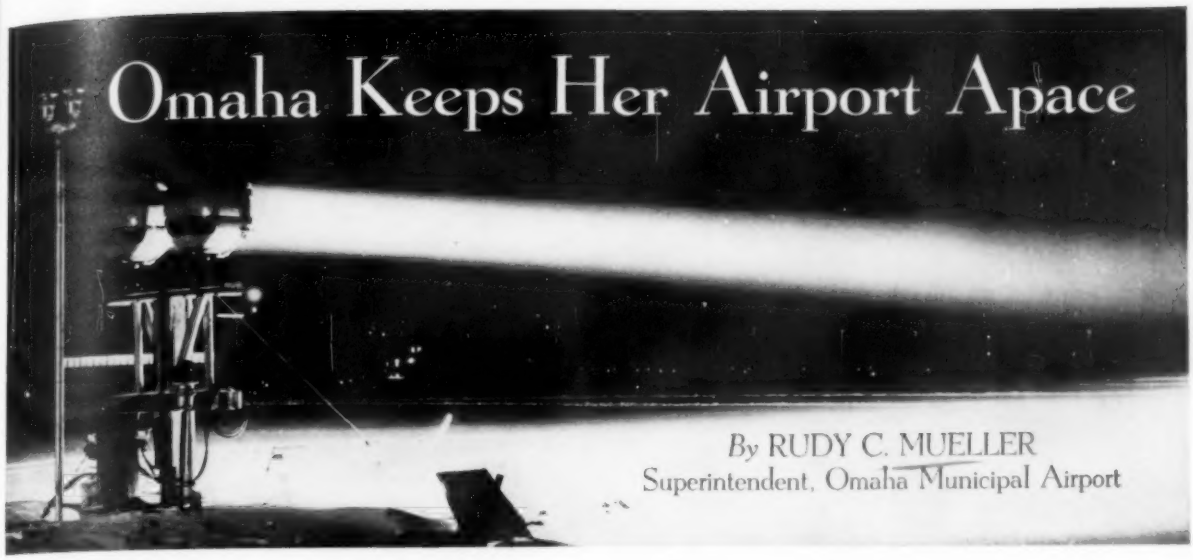
Yes, there is no inherent sanctity in a low tax rate, but no city can afford to bankrupt itself in the quest for security. So the yawning gap between yet unrealized civic requirements and the financial limitations to meeting them can be closed only by securing more value for the dollar spent. Municipal credit is beginning to concern itself as much with what cities get for their money as with what they spend. And it is possible to foresee the day when skepticism will completely undermine confidence in those cities where boss rule lingers, fat contracts still go to political favorites, hack politicians continue to encumber the payrolls, and the haphazard efforts of novices in administration have not given way to the planning of technicians. The sixth general principal of credit, *that a city's administration be conducted with reasonable economy and efficiency*, will tend to become more exacting as the science of municipal administration develops more and better standards for the measurement of its own performance.

It would be remiss to conclude this summary of the basis of municipal credit without reference to one very practical and influential requirement which overlies the entire field. In this day and age it is probably a distinction and a virtue that city governments generally do not resort to ballyhoo and high-pressure salesmanship to dazzle the public with their respective superiorities. But municipal government and municipal finance do need dignified, accurate, unbiased publicity. One not infrequently hears the question, why does this city, with its stable finances and conservative fiscal policies, fail to command the market for its bonds which it intrinsically deserves? And the answer usually is that the city has unwittingly but effectively concealed the facts, through the absence of published city reports, their laconic omission from bond prospectuses, or an involved and antiquated method of financial reporting which defies analysis.

Municipal financial reporting has made remarkable advances in the past few years. No one who has followed the trend can be other than highly impressed with the progress. But there are many cities with strong factors to commend their credit—successful solutions of difficult financial problems, adherence to sound borrowing and budget policies, special credit advantage through statute and charter provisions and state cooperation—which are failing to receive the full advantage of these factors because they have not been made a part of a readily available and understandable record. Full confidence in a community's credit arises not only from its maintenance of credit standards, but from the care and precision with which it accounts for its stewardship.

—Excerpts from a paper presented at the Annual Conference of the Municipal Finance Officers' Association of the United States and Canada, at St. Paul, Minn., August 16, 1938.

Omaha Keeps Her Airport Apace



By RUDY C. MUELLER
Superintendent, Omaha Municipal Airport

IF a million dollars and a considerable amount of forethought will turn the trick, Omaha plans to be ready for the super-liners and flying fortresses of tomorrow. With an eye on the future of the fast-growing aviation industry, Omaha completed the major portion of a $1,000,000 program of improvements in its municipal airport facilities during 1937, and will polish off the job during 1938.

The improvements included a complete new drainage system, the addition of 80 acres to the port area, new runways, an ultra-modern lighting system, and the paving and lighting of a road leading to the port. Government and airline operating officials have pronounced the field a model airport.

In 1935 the port had an area of some 228 acres, with three runways constructed of oil, sand, and clay, with a few small tile lines draining the lowest parts of the field. The lighting system consisted of floodlights, border-lights, and obstruction lights, controlled from a central power house, contacted by telephone from the Administration Building. The wires were insulated and wrapped with tar and paper.

Reconstruction Begun

The first step in revamping the airport was the enlargement of its area by the addition of 80 acres of land. Then a complete modernization program was laid out and financed with municipal and WPA funds.

The first problem was to improve drainage facilities, and 63,864 feet of concrete and vitrified clay pipe was laid in a series of laterals and main lines to carry the water to two central points where 12-inch centrifugal pumps, operated electrically with a capacity of 5,000 gallons a minute, deliver the drainage water to Carter Lake, west of the airport. The tile sizes range from 6-inch butt joint tile to 36-inch tongue-and-groove type, which carry the water to the lake. At all intercepting lines and at points along the runways, catch-basins and manholes were constructed to remove surface water. At the time the drainage system was installed, the water-table was 5 feet below the surface. After the system had been in operation thirty days, the water-table was 9 feet below the surface. The main lines empty into large concrete sump-boxes, inside measurements of which are 16 x 18 feet, and the bottoms of which are 15 feet below the surface. A brick building, 16 x 18 feet and 7 feet high, was built on each of these boxes to house the pumps, oil switches, fuse cutouts, and some of the transformers used in the lighting system.

The next step was the construction of a sanitary sewer system, taking the sewage from the Administration Building to the Missouri River, a distance of 7,500 feet, through 12- and 15-inch tile. Formerly we depended on a septic tank, fed by 12- and 15-inch tile. The new system carries sewage to within 800 feet of the river, where it empties into a concrete sump-box, 10 x 16 x 10 feet, where it is lifted 9 feet, and flows from there through 15-inch vitrified clay pipe to the river. This is handled by an 8-inch electrically operated centrifugal pump, which is housed in a 6- by 8-foot brick house.

Runways and Apron

A large area was cleared and graded before the runway construction was started. The soil of our airport is very sandy, which necessitated the building of a stabilized base for the runways. This stabilized base consists of a 6- to 12-inch sub-base of local soil, packed to a density of 130 pounds per cubic foot by sheepsfoot rollers weighing 6 tons and pulled by tractors. This was graded to within ½-inch variation and rerolled by a smooth tandem roller, weighing 8 tons. Then 5 to 8 inches of sand and gravel, mixed with clay and water, was spread and packed to a density of 150 pounds per cubic foot with the sheepsfoot rollers, to complete the base. This surface was graded to ¼-inch variation, and rolled with the 8-ton roller. It was then allowed to "cure" or dry out until it had reached sufficient hardness to permit a loaded 5-ton truck to roll over the surface without marking. Then a 2-inch binder course, consisting of 1¼-inch crushed rock, sand-gravel, blow sand, stone dust, and asphalt cement, heated to a temperature of 275 degrees, was laid hot and immediately rolled. A 1-inch top course, consisting of sand-gravel, blow sand, stone dust, and asphalt cement, was laid at about 300 degrees, and immediately rolled and cross-rolled.

AIR VIEW OF THE RECONSTRUCTED AIRPORT AT OMAHA, NEBR., SHOWING RESULTS OF EXTENSIVE MODERNIZATION PROGRAM

The relaid north-south runway was lengthened from 2,600 feet to 3,650 feet, and the new northeast-southwest runway is 4,200 feet long. The northwest-southwest runway is to be relaid of the same material the coming year. The east-west runway is to be relaid of similar construction.

A concrete apron, 175 x 300 feet, was constructed in front of the Administration Building for loading and servicing air line schedules. A taxi strip running from the apron past the three hangars is in the process of construction. It is being built of the old runway material remixed and packed with the heavy rollers. This taxi strip has an area of 44,000 square yards.

Lighting

The lighting project consisted of repairing and adding to the old system, by re-laying all new cable. The borderlight and floodlight cables are of the armored type parkway cable, and the main feeder and control lines are lead-covered, laid in Transite conduit, of which there is 14,000 feet. In all, there are 37 miles of wire. All lights will be controlled from a switchboard located in the Administration Building.

This year's work will include the re-laying of one runway and the installation of a control tower in the Administration Building.

The total cost of the project to date is $897,500, of which $354,000 was spent on runways at a cost of $1.98 per square yard, $427,000 on drainage, $70,000 on lighting, $31,500 on field grading, and $15,000 on the taxi strip.

The Omaha airport has two 100 by 100-foot hangars, and one 150 by 270-foot hangar. It serves two airlines, Mid-Continent and United, with a total of twelve schedules daily. The airport has 24-hour service from the Weather Bureau and from the Department of Commerce teletype system.

Research and progress are exceedingly swift in the aviation industry—so swift, in fact, that many communities are already handicapped by obsolete airport facilities. But Omaha means to be in the front rank of aviation's progress. Our airport can receive the largest land planes now flying, and the largest now projected. If still larger ships are built—well, we'll undoubtedly meet that problem too.

Agreement Between Labor and USHA

ON August 17, ten more Building Trades Councils affiliated with the American Federation of Labor, and 14 additional local unions, reported to the United States Housing Authority that they have adopted resolutions intended to obviate the possibility of any stoppages of work on low-rent housing projects to be built with USHA loans.

The latest Building Trades Councils to join the movement were those in Lafayette and Muncie, Ind., Lake Charles, La., Springfield, Mo., Plainfield, N. J., Minot, No. Dak., Fort Worth, Texas, Longview, Wash., and Milwaukee and Waukesha, Wis., together with 14 local unions in Fort Worth.

Thus 70 Building Trades Councils and 184 local unions have adopted resolutions which provide:

1. That in case jurisdictional disputes arise on a USHA project, there shall be no stoppage of work until such time as the Building and Construction Trades Department of the A. F. of L., the local Housing Authority and the USHA have had full opportunity to adjust the differences between the trades.

2. That wage rates in effect at the time work is commenced on such a project shall remain in effect until its completion.

It is the first time in history that such understandings have been reached by local authorities with labor unions, as a result of cooperation of a Federal agency, according to Walter V. Price, Director of Labor Relations for the USHA, who initiated and is carrying out the program.

The action of the unions is regarded as having inestimable value in making it possible to practically guarantee construction schedules in the $800,000,000 United States Housing Authority program.

Color and Hardness Removed from St. Augustine Water

Oldest City in North America Has Two-Million-Gallon Plant with Lime Softening

ST. AUGUSTINE, FLA., with its Fountain of Youth, old city gates, and old fort, attracts many thousands of visitors each year. Scarcely one of these visitors realizes the care that is taken with its modern Fountain of Youth, the water supply, to furnish a soft, palatable water from the highly colored shallow well water having a hardness of 400 ppm. The finished water has a hardness of 80 ppm, and the original color of 100 is reduced so that it is never more than 10. The housewives among the 14,000 resident population of St. Augustine are most enthusiastic over the new softened water supply they have been enjoying since August, 1937.

Source of Supply

The source of supply for St. Augustine is a battery of ten shallow 8-inch wells about 90 feet deep. They each have a 24-inch diameter gravel wall around the 10-inch screen and are pumped by 7-inch 5-stage Sterling deep-well turbine pumps direct-driven by 7.5-hp U. S. Electrical motors. Each well with its pump is located in a separate house, and the entire field of wells is between two and four miles from the softening plant. The pumps are controlled from the pump-house at the softening plant.

The stratum from which the water is drawn contains much iron, and the field is located in an area of second-growth pine and marsh from which considerable organic color is obtained. It is interesting to note that when pumping is started in the morning after the wells have been shut down for the night, after the pipe line has been pumped about an hour a flow of very red water comes to the plant, giving a bloody appearance to the aerators for a few minutes. The only explanation of this which has been offered, and which thus far has withstood other theories, is that the water receives some aeration through the pumps, after which partial oxidation of the iron takes place in the pipe line to the plant. When flow is stopped, the oxidized particles settle in the pipe and a resumption of pumping the next morning sweeps this red precipitate to the aerators.

Aeration

The battery of well pumps deliver the water to a 16-inch cast iron line from the well field to the plant. At the plant the line divides into two 12-inch risers which terminate in a pair of Infilco aerators which aid in the oxidation of the iron in the raw water, as indicated by the heavy iron stain on the concrete floor of the aerators.

As the water leaves the aerators, it is treated with a milk-of-lime dose of 12.5 grains per gallon through a 2-inch line from the lime-house, located about 300 feet away on a spur track. Then the treated water enters a mixing chamber where it has a retention period of 30 minutes and is thoroughly stirred by two 6-foot diameter spiral paddle mixers furnished by the Municipal Service Co., of Kansas City, Mo., driven by a 3-hp General Electric motor through a Link Belt variable speed gear box and reduction gear unit.

The Lime-House and the Clarifier

From the mixing chamber the water flows directly to a 55-foot diameter Link Belt Circuline clarifier entering at the center and flowing radially to a circumferential weir. The retention period here is about three hours. The Cir-

THE FRONT OF THE FILTER BUILDING OF THE WATER-SOFTENING PLANT AT ST. AUGUSTINE, FLA.

culine sludge collector is not operated continuously during the time the plant is in service, but is used simultaneously with the sludge pump. The Straightline scraper carries the sludge to a central sludge well, from which it is pumped by a Carter sludge pump operated from two to four hours daily. This pump is started and stopped by a switch in the sludge pump-house instead of from the filtration plant switchboard, for a valve at the pump must be opened by hand before the pump is started, and shut again when the pump is stopped. It would be a needless expense for a plant of this size to have remote control for the small pump and for the small valve.

The lime-house is located on the railroad spur, since unslaked lime is bought in carload lots and unloaded direct to the storage bins over the feeding and slaking devices through a chute and Link Belt bucket elevator. The International dry feeder is suspended so that when the feeder hopper is filled with unslaked lime the total weight is shown on beam scales. Each hour that the plant is in operation one of the men takes a reading on the beam scales and thus determines the amount of lime consumed per minute. When the scales reading is less than 100 pounds, another lot of lime is pushed in from the storage bin above.

The lime falls into a mixing hopper which has an independent drive for the stirring mechanism which aids in completely slaking the lime before it runs over a weir slot in the side of the mixing hopper to the pump suction. A unique arrangement here prevents the pump from losing suction and failing to deliver lime to the plant. The lime first runs through a wire basket to catch any foreign matter such as straw, sticks or unslaked lumps. Then the lime is hastened in its flow to the pump suction by a constant stream of water, which is absolute insurance against the pump's losing prime for more than an instant. A float valve in the hopper checks the flow of priming water if for any reason the hopper fills up owing to the stopping of the pump or the clogging of the suction line. All slaking water is metered.

A pair of American Well Works 1-inch centrifugals driven by separate 1-hp Westinghouse motors deliver the slaked lime through the 300-foot line to the effluent of the aerators. These pumps are alternated in service.

Reducing the Color

The color of the water is reduced from 100 to about 28 by the action of the lime softening, but this is not low enough for satisfactory domestic use. As the water flows from the Link Belt clarifier through a 16-inch cast iron pipe, it receives from 3.5 to 4.0 grains per gallon of black alum in solution. A secondary mixing basin has been built into the end of the rectangular settling basins and equipped with a single stirring device similar to those used between the application of the lime and the clarifier. The period of mixing is about 20 minutes here, and then the water flows through a slot 16 inches wide and 3 feet high at one end of the basin and behind a perforated diffusion wall which gives a uniform distribution of the water as it enters the settling basins, where it has a three-hour detention period.

At the far end of the settling basin, which measures 67 feet long by 30 feet wide and has a water depth of 14 feet, the settled water flows out over a pair of weirs to the recarbonation basin and through it to the distributing channels leading to the two filters. The recarbonation basin was constructed because it was thought there would be need for the application of carbon dioxide gas after the softening, but since the plant was placed in operation it has been found that the high slum dose after the softening supplies sufficient carbon dioxide to take care of the requirements. Therefore the city is offering its recarbonation plant for sale. The plant is equipped to burn gas, but could be installed for other fuels such as oil.

Chemical Treatment

As one enters the filter floor from the trip around the settling basins, the door leads directly into the chemical room, where two Infilco dry feeders deliver the alum to the secondary mixing basin. Soda ash is fed to the filtered water as it comes from the filters and flows to the clear well. The soda ash is supplied at the rate of about 1.5 grains per gallon. An elevator in the corner of the room is used to raise the chemicals from the ground unloading platform to the second floor.

In a small room adjacent to the chemical room is the single Wallace & Tiernan vacuum type chlorinator with a rubber feed pipe leading to the suction sides of the transfer pumps moving the filtered water to the nearby clear well. Chlorine is applied at the rate of 5.5 pounds per million gallons, leaving a residual of 0.2 ppm in the water in the clear well.

The laboratory is located on the same floor with the filter operating tables and the chemical room. It contains a complete Infilco sampling stand and is equipped with apparatus for all standard chemical tests. It is planned to install equipment for bacteriological work in the near future.

Filtration

The two rectangular filters measure 18 feet by 20 feet each and have a combined capacity of 2 mgd. They have concrete wash-water troughs located with the tops 22 inches above the top of the sand. The underdrains are perforated cast iron pipe laterals on a cast iron manifold. Over the pipes are 18 inches of graded gravel and 30 inches of filter sand. Each filter has its own Simplex rate-of-flow controller and on the Infilco control table for the hydraulically operated valves are Simplex recording rate-of-flow and loss-of-head gages. Immediately beneath the filters is a 70,000-gallon clear well for filtered water, from which the wash-water pump takes its suction, thus making it unnecessary to pump the water twice for filter washing. A Simplex gage on the operating floor shows the depth of water in the 1-mg clear well.

Low-Lift and Wash-Water Pumps

On the ground floor of the filtration plant are the transfer pumps which raise the water from the clear well a height of about 12 feet maximum to a 1,000,000-gallon covered reservoir about 100 feet distant. These are two American Well Works 1,400-gpm centrifugals, each with a 7.5-hp Westinghouse motor operated alternately. The wash-water pump, located at the end of the wash-water line, is a 6,000-gpm American Well Works centrifugal with a 75-hp Westinghouse motor. The heavy-duty valves

throughout the plant are Chapman valves with both manual and hydraulic operation.

The switchboard, located adjacent to the three pumps, controls all motors in the filter house except the wash-water pump, the oil switch control for which is on the operating floor. Each of the pumps is primed by a Skidmore automatic priming pump to insure immediate re-prime if for any reason there is a momentary lack of water at the bottom of the pump suction in the clear well.

Two Republic flow meters mounted on the wall near the pumps show the rate of flow of the raw water to the plant, and the amount pumped by the transfer pump to the clear-water well. A panel of six gages in the front wall of the pump-room shows the vacuum and the pressure on the discharge of each of the three pumps.

In the high-pressure station, which was built before the present softening plant, are two Fairbanks-Morse centrifugal pumps of 850 gpm and 2,100 gpm capacity driven by 40- and 150-hp motors respectively. The smaller pump handles the load most of the time, with the larger pump ready for emergencies such as a long draft because of a fire. As a standby unit in case of power failure, a 300-hp Sterling gasoline engine direct-connected to a 3,500 gpm Fairbanks pump is ready for instant service.

In addition to this equipment there is one 1,800-gpm Fairbanks-Morse low-head pump with 25hp F-M motor

WATER SOFTENING AT ST. AUGUSTINE, FLA.

1. The Infilco aerator. 2. The drive for the stirring mechanism in the mixing chamber, and in the background the Link Belt Circuline clarifier. 3. The settling basins with the secondary mixing basin built into the far end. 4. The clarifier and the 300,000-gallon elevated storage tank which floats on the high-pressure system

still connected to the old flowing wells that have been cut out from the present supply. This pump can be used to deliver water from these wells to the present softening plant in case of temporary shut-down from the new well field or damage to the pipe line. A pressure of 50 pounds or a 116-foot head is maintained on the discharge of the pumps delivering to the 300,000-gallon elevated storage tank floating on the high-pressure system and located behind the pumping station and softening plant. It was installed in 1926 by the R. D. Cole Co. In addition to the 300,000-gallon elevated tank, there is a 280,000-gallon steel standpipe located in the center of the business district, which serves to equalize pressure over this area as well as furnish additional storage in the heart of the high-value district.

The new water-softening plant has been operated between 8 and 10 hours daily since it was started, but beginning early in April it was placed on a 16-hour operating day with two shifts to provide slower operation with longer settling periods. The plant was designed by Robert & Co. of Atlanta, Ga. The building contractor was G. W. Hessler, Inc., of Jacksonville, Fla., and the pumps and equipment were installed by Municipal Service Co. of Kansas City, Mo. Construction was completed and the plant put in service in August, 1937. It is operated under the direction of Robert M. Johnson, Chief Operator and Chemist. John Center is Superintendent in charge of high-pressure pumping and distribution. Prof. A. P. Black, University of Florida, is Consulting Chemist for the plant.

T. R. K.—70

City of Akron Garbage Survey—Organization and Procedure

By T. B. KIMBER
Chief Clerk, Department of Public Service, Akron, Ohio

THE maintenance and operation of an adequate and thoroughly satisfactory garbage collection service has been a troublesome municipal problem in normal times. During the past six years, drastically reduced budgets and curtailed expenditures have intensified the problem, and have, in fact, helped make garbage collection one of the persistent municipal headaches.

During recent years, Akron, like many other municipalities, has been forced to operate its garbage collection department on approximately 60 per cent of its 1929-1930 budgets. Such drastic reductions naturally have impaired the collection service. Where and how much to cut without serious consequences has been the problem.

In 1936, Akron was operating its collection service on 54 per cent of its 1930 budget. With expenditures at an absolute minimum, it was felt that an exhaustive survey of the collection department would not only result in suggestions for the improvement of the service, but also point the way to posible economies. Accordingly, in September of 1936, a survey was undertaken under the direction of Service Director W. F. Peters, the factual data of which were compiled in a detailed report of some 70 pages.

Scope of the Survey

The analysis of one complete city-wide collection by means of a physical check of all activities was the point of departure for the survey. This involved a time, mileage, routing and tonnage study of each collection unit. Closely allied to collection problems is the manner in which garbage is prepared by householders for removal. Consequently, a study of household treatment was undertaken simultaneously. Finally, as a basis of comparison between individual truck units, and as a means of viewing collection department expenditure in all its phases, a cost analysis was made.

The Field Work

To obtain the necessary field information, two men were needed to follow each truck through one complete collection. With a force of twenty-three men supplied by WPA, six crews of two each were assigned to six collection units to follow each unit through its collection district and to record the data requested on pre-designed forms. As a truck completed its district, the same checking crew was re-assigned to another district, until all districts had been recorded. Part of the remaining crew assembled tonnage, cost and complaint information from departmental records; others assisted in the tabulation recorded by the field crews, and two men prepared a large-scale map showing the activity of each truck.

Two daily forms were supplied the field crew. The first, Form A, supplied the necessary information on the physical activities of each collection truck. The crew recorded information in the proper spaces as collection proceeded; the daily totals and averages on this form were tabulated later by the office crew. Notation was made of each and every street on which the truck traveled, including the point of entry into the street and the point of departure from the street. This routing information was subsequently transferred to a large-scale city map on which each truck's activities were shown in separate color.

The second form, Form B, was furnished the checkers to note violations of a city ordinance which requires that premises provide "watertight galvanized iron receptacles of not less than 10- or more than 30-gallon capacity with a suitable cover of the same metal, for the reception of all garbage." Space was provided to note the address and nature of the violation. At the same time, the general location and general character of the district in which the violation occurred were recorded.

Experience proved that after careful definition of terms,

together with general instructions and one day's experience in the field, a two-man crew could record accurately all the information requested in Forms A and B.

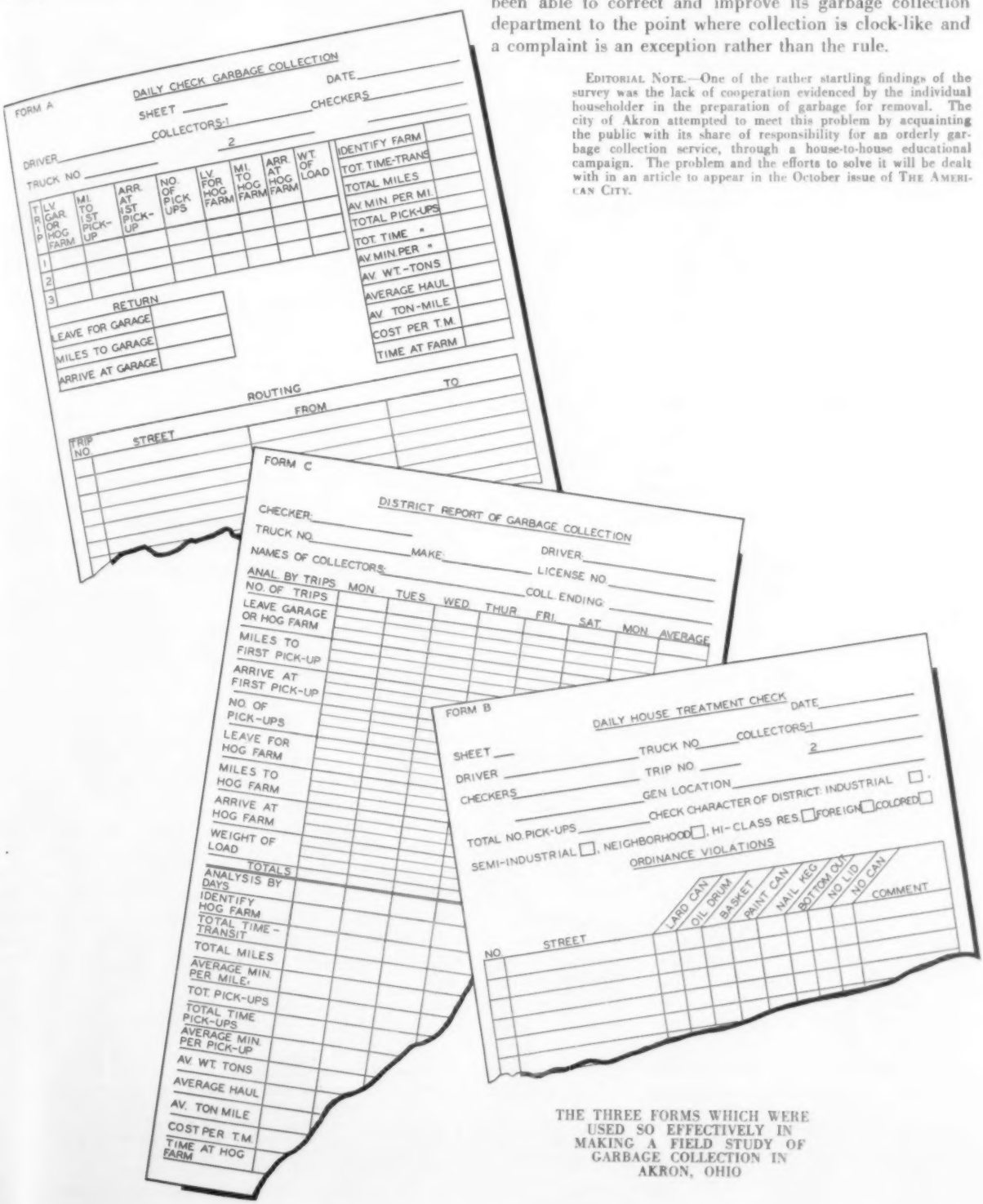
As a truck unit completed its collection district, the daily Form A reports were then tabulated on the district report, designated Form C. Thus, district totals and averages were obtained. At the conclusion of one city-wide collection, the district reports in turn were totaled and averaged for the complete picture of the city of Akron's garbage collection activities.

Likewise, the Form B reports, relative to the household treatment check, were tabulated and broken down by location, character of district and by nature of violation.

With the field information assembled, it was then possible to proceed with the analysis, and to make needed suggestions for the improvement of the service. The physical check took a month in the field, and the tabulation and final report required two additional months for completion.

Upon the findings of this survey, the city of Akron has been able to correct and improve its garbage collection department to the point where collection is clock-like and a complaint is an exception rather than the rule.

EDITORIAL NOTE.—One of the rather startling findings of the survey was the lack of cooperation evidenced by the individual householder in the preparation of garbage for removal. The city of Akron attempted to meet this problem by acquainting the public with its share of responsibility for an orderly garbage collection service, through a house-to-house educational campaign. The problem and the efforts to solve it will be dealt with in an article to appear in the October issue of THE AMERICAN CITY.



THE THREE FORMS WHICH WERE USED SO EFFECTIVELY IN MAKING A FIELD STUDY OF GARBAGE COLLECTION IN AKRON, OHIO

Many Fire Companies Are Licked Before They Roll Out of the House

EXPERIENCE in fire service is that two deciding factors control fire losses of America: quick discovery of fire; preventing fire from extending and involving the entire building. Factors militating against this control are that:

1. Many buildings are vacant during a large portion of the time, when fires cannot readily be discovered.

2. American buildings have open stairways and elevators, and excessive areas which permit rapid spread of fires.

These structural conditions, plus highly combustible occupancy in many cases, make it possible for even a small fire to involve a building *when people are present*—unless means for extinguishing the fire are provided.

Many fire departments are licked before they roll out of the house, because of delayed alarm; lack of extinguishment facilities; structural encouragement of fire.

What have municipal officials to do about this? Plenty. A disastrous fire is no badge of achievement. It is bad for the administration, the fire chief, the occupant or owner, the insurance company, and the city—for 47 per cent of the industries burned out do not rebuild in the same city. That is bad for business.

What should municipal officials do to pinch out fires in their incipiency? They can by ordinance require that old as well as new buildings be equipped with:

1. Alarm service, automatic or manual or both
2. Extinguishing devices for special hazards
3. Hand extinguishers

Modern alarm equipment can be adjusted to take all manner of precautions, such as shutting doors and windows, closing dampers of ventilating systems and stopping blowers. Film factories and theater stages must be thus equipped. Modern lofts and department stores have both alarm and sprinkler systems. The heat turns on the sprinklers, and the flow of water in the distribution system calls the fire department. Incidentally, it is a fact that lower fire insurance rates pay for the sprinkling system in ten years. Cities with more modern building codes require that sprinklers be installed in buildings exceeding certain dimensions.

But, as with all other devices which have proved their worth, fire extinguishers should be installed wherever needed and be maintained for instant use.

OFFICER FRANK CONDON, DOBBS FERRY, N. Y., PACKING A FIRE EXTINGUISHER ON HIS HARLEY-DAVIDSON MOTORCYCLE

FIRST TO INSTALL FIRE EXTINGUISHERS ON TRAFFIC STANDARDS

At traffic station at Canal and Rampart, New Orleans, with officer Frey examining one of the fire extinguishers which Safety Commissioner Frank Gomila ordered installed on the traffic-signal standards of all stations on Canal Street from Rampart to Magazine Street. Motorcycles also carry extinguishers

Ask the Fire Department

All fire departments, even the volunteers, are interested in fire prevention. Sometimes the particular bureau consists of one man; sometimes of a whole force specializing on the adequate protection of buildings and processes.

Firemen know the results of not having sprinkling, extinguishing and alarm equipment. They should also be trained in the values of all types of these devices, so that the increasing number of people who will naturally turn to the Fire Department for information will have their confidence confirmed.

This is something for the city to be selfish about. It is citizens' property that burns, and insurance rarely pays full damage. Destruction of property reduces the valuation of the community and tends to increase the tax rate. The prevention of this loss demands a strong fire department with all which that means, including an inquiring fire-prevention bureau and a sound building code, enforced.

New Jersey Police Chiefs Study

The Bureau of Public Safety of Rutgers University (Lawrence B. Tipton, Head) announces the 1938-39 series of three two-day Institutes for Police Chiefs of New Jersey municipalities, covering practice and scientific methods in the operation of a police department. Opportunities will be given for the exchange of ideas and for discussions of current problems relative to the operation of police departments in large, medium-sized and small municipalities.

Diesel Plant Charges 5 Cents Per Kwh and Makes $44,532 Gross Profit

By THOMAS A. WALSH
Manager, Light and Power Department, Hudson, Mass.

WITH total annual production costs ranging from 6.4 mills to 7.3 mills per kwh, the Hudson diesel-electric plant is selling electricity at the lowest domestic rates in New England, and in 1937 made a gross profit of $44,532. During the last fifteen years the rates have decreased from an average of 11.3 cents per kwh to a present average of 3.6 cents, as follows: 5 cents for first 20 kwh; 3 cents for next 80; 2 cents for next 100; 1 cent for over 200 kwh. Average consumption per customer is 791 kwh.

The commercial lighting rate is 5 cents for the first 40 kwh, and slides to 1 cent for more than 240 kwh. A second commercial scale gives 100 kwh at 4 cents, and 1,200 kwh for 3 cents. The wholesale rate is 2½ cents for the first 50 hours' use; 2 cents for the next 50 hours; 1½ cents for the next 75; 1 cent for the next 75; 0.8-cent for over 250 hours' use. There is a second wholesale rate primarily for refrigeration plants having a capacity factor averaging 40 per cent and purchasing current at 2,300 volts. This rate starts at 2½ cents for the first 30 hours, and slides to 0.7-cent for over 120 hours' use.

Steam to Diesel

In 1897 the town purchased the private steam plant and moved it to the present site. A 1,000-kw turbine added in 1918 brought plant capacity to 2,200 kw, and power was also purchased from a transmission line, this arrangement continuing until 1928. Meanwhile, equipment was aging, and the last 18 months of this period were occupied by an investigation into whether: (a) to purchase power; (b) build a high-pressure steam plant; (c) do both (a) and (b); (d) go all diesel.

An all-diesel plant was decided on, with an expectation of producing electricity for 9 mills. Accordingly, in 1928 the first three McIntosh & Seymour 4-cycle air-injection diesel engines were purchased, and the kwh cost has always been under the estimated figure.

The number of customers at Hudson increased from 1,955 in 1922 to 3,287 in 1937, and includes 187 power customers, many of whom formerly generated their own energy. Total kwh generated annually increased from 1,130,000 in 1922 to 8,036,300 in 1937—seven times. The total income in 1937 was $162,076, and expenses exclusive of bonds and interest thereon were $117,544, giving a gross profit of $44,532—a remarkable achievement in view of the low rates.

New Diesel—13 Kwh Per Gallon

This increase in demand made it necessary to install an additional unit in 1937. The unit selected was a 1,480-bhp Alco-Sulzer 2-cycle diesel engine built by American Locomotive Co. and driving a 1,000-kw, 2,400-volt (80% power factor) General Electric AC generator.

HUDSON LIGHT AND POWER DEPARTMENT
COSTS FOR 1937

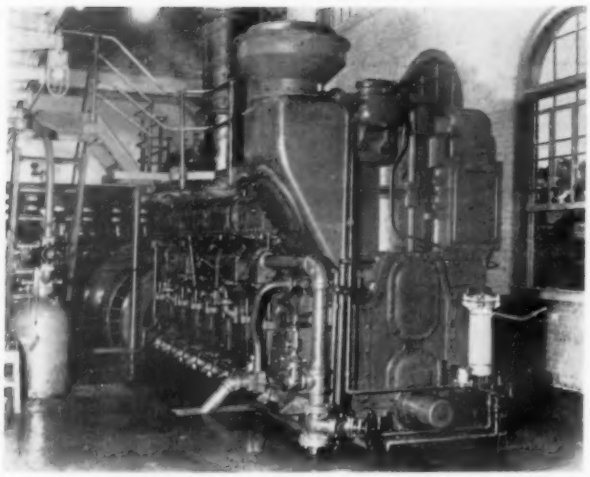
Total kwh generated	8,036,300	
Total kwh delivered	7,179,853	
Production Expenses		Per kwh Delivered
Fuel labor	$ 78	.00001
Engine labor	19,056	.00265
Electrical labor	925	.00012
Engine fuel	26,317	.00366
Water	475	.00006
Lubricants	2,416	.00033
Station supplies and expenses	1,817	.00025
Maintenance station structures	400	.00005
Maintenance fuel system	913	.00012
Maintenance engines	7,346	.00102
Maintenance of auxiliaries	250	.00003
Maintenance elec. gen. equip.	229	.00003
Maintenance accessory elec. equip.	479	.00006
Maintenance misc. power equip.	10	.00000
Total production expenses	$60,711	.0084
Distribution expenses	13,672	.0019
Utilization expenses	2,211	.0003
New business expenses	4,063	.0005
General expenses	36,878	.0051
Total operation expenses	$117,535	.0162
Overhead Costs Chargeable to Production		
Depreciation	9,898	.00137
Interest on bonds	436	.00006
Bond repayments	7,500	.00104
Insurance on production equipment and additional men	2,000	.00027
Total overhead	$19,834	.00274
Total production expenses	60,711	.00845
Total overhead and operating costs chargeable to production	$80,545	

The new engine shows very steady performance at 50 to 110 per cent full load. Between these loadings, fuel consumption in pounds per brake horsepower hour ranges from 0.422 to 0.397, and efficiencies from 31.6 to 33.5 per cent. An important feature is the scavenger pump which blows the burnt gases from the cylinders and, when the piston covers the exhaust ports on up-stroke, permits air to blow into the cylinders, resulting in complete smokeless combustion as well as conservative exhaust temperatures.

Our generators are all engine-driven synchronous type, wound double-circuit Y, 2,400 volts with provision to change to single-circuit Y, thus increasing the voltage of our station bus and distribution system and making possible a large increase in system output without having to increase line copper.

The three original air-injection engines have a central lubricating-oil system and the larger two engines have individual lubricating-oil systems and oil-cooled pistons. All the engines are force-feed lubricated. They continue to maintain their original economy, generating 12.26 kwh per gallon. The new engine delivers more than 13 kwh per gallon when operating as low as two-thirds capacity.

Engine cooling water is provided by a recirculating sys-



INCREASED SALES ADDED THIS 1,480-HP ALCO-SULZER TWO-CYCLE UNIT TO THE 1,200-, 650,- AND TWO 900-HP FOUR-CYCLE McINTOSH & SEYMOUR DIESEL UNITS, BRINGING OVER-ALL GENERATION TO 13 KWH PER GALLON OF FUEL OIL

tem, which in turn is passed through a heat exchanger where the jacket water is cooled by raw water pumped from a brook.

Fuel and Lubrication

The fuel used is known as Navy A or Bunker A, ranging from about 18° to 23° gravity API. It is a straight run residue from Coastal Crude supplied by the Cities Service Co. at an average cost of 3.5 cents per gallon, or about ¾-cent higher than Bunker C fuel and 1 cent cheaper than the standard distillates normally used in diesel engines.

The lubricating oil is Texas Ursa and is handled on the by-pass centrifuge method. Routine analyses are taken, and after 2,000 hours' operation it is found that the original viscosity of 750 @ 100° SU has increased, and after further purification by settling, this oil is brought back to its original viscosity with Texas Company's Algol.

The operating crew consists of a chief engineer, seven watch engineers and assistants, and three maintenance men, the seventh engineer being a relief man. George D. Noiles is Chief Engineer of the power station.

The Department maintains 85 miles of lines. During the past year we have placed on various circuits 300 kva of capacitors, mostly GE and Cornell Dubilier, and are well satisfied with the results.

Load Building

We added 62 electric stoves and 11 water heaters to the system last year, a normal year's increase. We also have extended our lines in the rural section, using long spans and high-strength Copperweld. We have cut installation costs enough to enable customers now to come on our lines. Benjamin A. Pond is Superintendent of Lines.

We also underwrote for the high school an installation of floodlights for night football, about which the *Daily Sun* says:

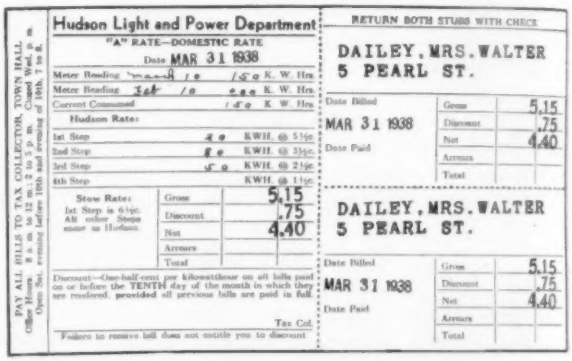
"The floodlighting system, purchased from the Giant Manufacturing Co., is one of the best installations in this section and is the first permanent one made for scholastic sports in this state. Equipped with Hygrade Sylvania 1,500-watt bulbs, the system gives excellent lighting, making the game as completely visible as daylight playing. The excellent lighting of these bulbs has aroused considerable comment from lighting experts who have viewed the system in Hudson and expressed surprise at the brightness of the field."

Billing and Accounting

Our billing system is very simple. The meter readings are entered on a card each month by the meter reader, who reads certain routes on definite days. The bills are made up on Government postcards, which are printed and scored as per sample. We buy and have printed 10,000 cards every three months. They are addressed on an Addressograph machine in the office.

When the meter cards come in in numerical order, the clerk picks out the addressed postcard and writes in the kwh consumption shown on the meter card. This clerk has a rack of rubber stamps on her desk. The handle end of the stamp has the kwh marked on it. The stamp end has the gross, the discount and the net amounts of the bill. The clerk picks out the stamp corresponding to the kwh consumption and stamps the bill and both stubs.

All bills are paid to the town Tax Collector, who stamps the bill PAID, returns it to the customer, and detaches both



Hudson Light and Power Department

"A" RATE—DOMESTIC RATE

Date MAR 31 1938

Meter Reading (Present) 1 0 150 K. W. Hrs.

Meter Reading (Last) 1 0 000 K. W. Hrs.

Current Consumed 150 K. W. Hrs.

Hudson Rate:

1st Step 40 KWH. @ 5.1¢

2nd Step 80 KWH. @ 3.5¢

3rd Step 50 KWH. @ 2.1¢

4th Step KWH. @ 1.1¢

Stow Rate: 1st Step is 6.5¢. All other Steps same as Hudson.

Gross	5.15
Discount	.75
Net	4.40
Arrears	
Total	

Discount—One-half cent per kilowatthour on all bills paid on or before the TENTH day of the month in which they are rendered, provided all previous bills are paid in full.

Tax Col.

Failure to receive bill does not entitle you to discount.

PAY ALL BILLS TO TAX COLLECTOR, TOWN HALL. Office Hrs. 9 to 12 A.M., 2 to 5 P.M. Closed Wed. & Sun. Open Sat. evening before 10th and evening of 15th, 7 to 8.

RETURN BOTH STUBS WITH CHECK

DAILEY, MRS. WALTER
5 PEARL ST.

Date Billed	Gross	5.15
MAR 31 1938	Discount	.75
Date Paid	Net	4.40
	Arrears	
	Total	

DAILEY, MRS. WALTER
5 PEARL ST.

Date Billed	Gross	5.15
MAR 31 1938	Discount	.75
Date Paid	Net	4.40
	Arrears	
	Total	

POSTCARD BILL MADE BY PEN, RUBBER STAMP AND ADDRESSOGRAPH. STUB RECEIPTS ARE POSTED TO LEDGER CARD BY DALTON DUPLEX BOOKKEEPING MACHINE

stubs, one of which he keeps and the other he returns to the Department.

The billing clerk posts the billings on a ledger card. When the stubs come back from the tax collector, the chief clerk posts the receipts on the same ledger card and checks the stubs against the tax collector's returns. Then the ledger cards are totaled for receipts, discounts and arrears. This is handled by a Dalton Duplex bookkeeping machine. When all check, our accounts receivable statement is sent to the town accountant.

Revenue for 1936 was $153,150, and for 1937 $162,076. Total expenses for 1936 were $106,751.76, and for 1937 $117,544. Taxes for the last six years would have been $14,166 per year, and the Department has returned to the town during these six years $13,877 per year. The payroll of $48,000 was spent mostly in Hudson, as was an additional $11,771, making local expenditures of $59,771, or one-third of the total income. The dollar of expense goes as follows in cents: bonds and interest, 5; depreciation, 12; returned to town, 2; wages, 30; fuel and lubricating oils and station supplies, 20; maintenance, 4; plant improvement, 22; new business, 2; other, 3.

Self-Supporting Swimming Pools

AMONG New York City's recreational facilities which pay their way are the three swimming pools shown here: Sunset Park and McCarren Play Center, serving respectively a better-class Scandinavian quarter and a crowded low-income district, and the Astoria pool, visible from the Triborough Bridge as a sheet of blue water on the Queensborough bank of the East River.

These three large outdoor swimming pools produce pleasure as well as revenue, and to do either requires that they be well cared for. The first requisite is an abundance of pure water, secured by recirculating systems, open-top filters, and Wallace & Tiernan sterilizing equipment and Permutit dry-chemical feeding equipment, which creates a floc and controls the acidity and alkalinity of the water and aids in filtration.

The Sunset Park swimming pool, 165 x 256 feet and of 1,240,000 gallons capacity, with a separated adjacent semi-circular diving pool of 100-foot radius and 475,000 gallons capacity, recirculates 3,600 gallons per minute. Continental-motor-driven De Laval pumps do the job for the two pools eight times in three hours. The photograph shows this pool at night lighted, as are the other pools, by Russell & Stoll underwater floodlights.

Freshened Water

In the Astoria pool, water is circulated by two Lecourtenay 6,000-gallon single-stage pumps, driven by Atlas Imperial diesel engines of 200 hp and 50 hp respectively, using two Falke geared speed-up units of 5.3 to 1 ratio. In the photograph showing this system, the bottom pipe brings the water from the treatment tank through the 50-hp driven pump and up and over to the filters at the top right. The water passes by gravity through the filters to the clear well, from which it is pumped back to the pools

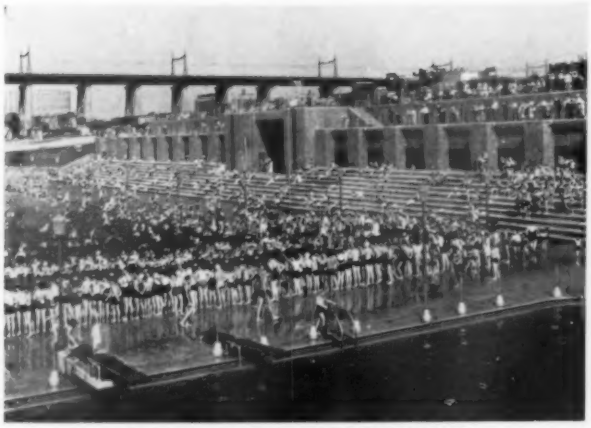
SUNSET PARK POOL, BROOKLYN, N. Y.
Floodlights and underwater lights keep the pools earning and giving pleasure after business hours

by the 200-hp diesel-driven pump behind the column at right foreground. There are five open-type gravity filters with backwash troughs. Basin level regulators of the International Filter Co. control the level, and the filtration and backwash rates are regulated by International rate-of-flow controllers. The circulation system around the entire pool wall consists of a series of A and B type ejector inlets and outlets, one of which attracts into the ejector line the water from the lower portion of the pool, ordinarily a dead pocket, thus guaranteeing circulation of every gallon of water in the pool. These ejectors are made by the Josam Manufacturing Co., and were first used in the New York City Park Department pools.

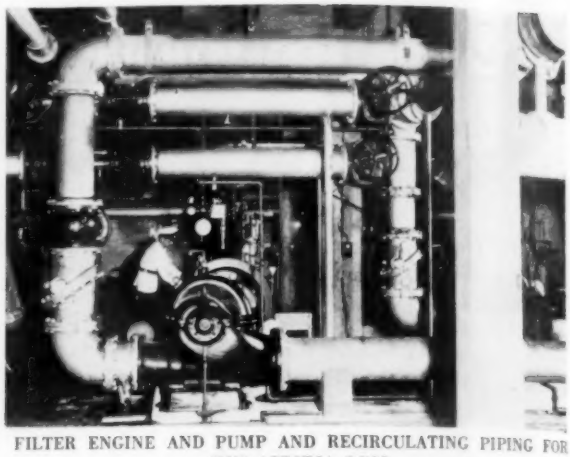
The exhaust heat of the diesel engines, about 700 degrees, is utilized by a Foster & Wheeler waste heat boiler to control the temperature of the swimming pool water.

As the pools are situated in congested residential areas, it is necessary to eliminate sound, which is achieved by

McCARREN PLAY CENTER, BROOKLYN, N. Y.
A city provided health and happiness in a drab district—and do the people like it!



ASTORIA POOL, QUEENSBOROUGH, N. Y.
This is neither ancient Rome nor the bank of the Ganges, but people the world over love bathing



FILTER ENGINE AND PUMP AND RECIRCULATING PIPING FOR THE ASTORIA POOL
Without this and the efficient sterilizing equipment, healthful public bathing would not be possible

Maxim silencers (22 feet long x 2 feet in diameter) installed in the exhaust systems, and by Atlantic flexible hose used in the joints of the system. This hose prevents torsional vibration from being transmitted to the building.

The pool walls and bottoms are cleaned daily or every other day by vacuum cleaners and scrapers, handled by men wearing diving helmets, all equipment manufactured by the Hanson Engineering Co.

A major problem was solved only this year by the discovery of a satisfactory paint to use on the concrete. This paint, supplied by the Vestal Chemical Co., on standard specifications of the city of New York, is now used by the city for all concrete floor covering and 4,610 gallons of it are needed in a year for the swimming pools alone.

A Pool in Use

In one of the most congested of the underprivileged neighborhoods of Brooklyn, N. Y., at Lorimer Street and Nassau Avenue, a comprehensive play center has been constructed centering upon the swimming pool, 165 x 330 feet, with a semi-circular diving pool of 100-foot radius. Opened in 1936, these pools accommodated 285,252 persons in 1937, and 116,335 this year to July. The checking capacity is 6,000, the season May 28 to September 11. This swimming pool is lighted by 1,000-watt floodlights, the diving pool by 1,500-watt lights, the wattage totaling 80,000. The total capacity is 1,865,000 gallons, recirculated and treated as described for the Astoria pool.

From 10 A.M. to 12:30 P.M. on week-days, this pool, as well as all other outdoor pools in the city, is free to children under 14, and 175,844 availed themselves of this privilege in 1937. From 1 P.M. to 10 P.M. the charges are 10 cents for children and 20 cents for adults. These rates obtain all day on Saturday, Sunday, and holidays. The pool is self-supporting, though used as a free play center for 54 per cent of the time. In addition, the free swimming period accounts for 9 per cent of the recreational year; the revenue-producing period for only 31 per cent of the time. The remaining 6 per cent of time is required to drain and paint the pool for the "dry games," including basket-ball, paddle tennis, volley-ball, and shuffleboard. The indoor area, consisting of bath-houses and checking rooms, is prepared for games and dancing after the swimming season has closed.

Housing Authorities Law Upheld in Florida

IN a far-sweeping decision, the Supreme Court of Florida has upheld the constitutionality of the Housing Authorities Law of Florida, thus clearing the way for local participation in the benefits of the United States Housing Act of 1937 providing for the $800,000,000 slum clearance and low-rent housing program now going forward under the supervision of the United States Housing Authority.

This decision brings to seven the number of courts to consider and to pass favorably on the validity of various provisions of public housing legislation. In addition to the Supreme Court of Florida, the highest courts of the following states have recently passed favorably upon provisions in similar statutes: New York, North Carolina, Kentucky, Alabama, Louisiana and Pennsylvania.

The plaintiff, as a taxpayer, brought suit against the Housing Authority of Jacksonville to enjoin the body from issuing bonds and acquiring property for low-rent housing purposes; and the city of Jacksonville was joined as a party defendant to prevent the city from entering into a contract to demolish substandard dwellings in the city and from entering into a contract to furnish municipal services to the Housing Authority and its tenants. In its opinion, the Supreme Court of Florida held specifically that:

1. The Housing Authority of Jacksonville was organized for a public purpose and its functions of clearing slums and constructing low-rent housing projects were public and not private purposes.

2. The fact that the Housing Authorities Law vests a local housing authority with the power of eminent domain was not an unconstitutional delegation of such power because the purpose for which the power would be exercised was a public use.

3. The bonds and other obligations of the Housing Authority of Jacksonville issued to finance the development of a low-rent housing project were not "bonds" within the meaning of amended Section 6 of Article 9 of the constitution of the state of Florida, so as to require a vote of the freeholders.

4. All the real and personal property owned by the Housing Authority of Jacksonville is exempt from all ad valorem taxes.

5. The city of Jacksonville had the legal power to enter into a binding contract with the Housing Authority of Jacksonville whereby the city contracted to bind itself to effect the equivalent elimination required by the United States Housing Act of 1937.

6. The city of Jacksonville had the legal power to enter into a contract with the Housing Authority of Jacksonville to cooperate and aid the Authority in constructing a low-rent housing project, and it could legally agree to render municipal services for the benefit of the Housing Authority and its tenants free of charge.

Well-Planned Snow Removal

By E. L. TRACY
Commissioner of Public Works, and City Engineer, Rutland, Vt.

IT is now an accepted fact that roads must be maintained in winter to provide travel facilities as nearly equal to summer driving as possible. Plowing must be done quickly. This requires sufficient equipment to cover an entire city within a short time. Snow must be entirely removed from the business section at least, and sanding must be started as soon as traffic develops a slippery surface on the snow, as well as after sleet storms.

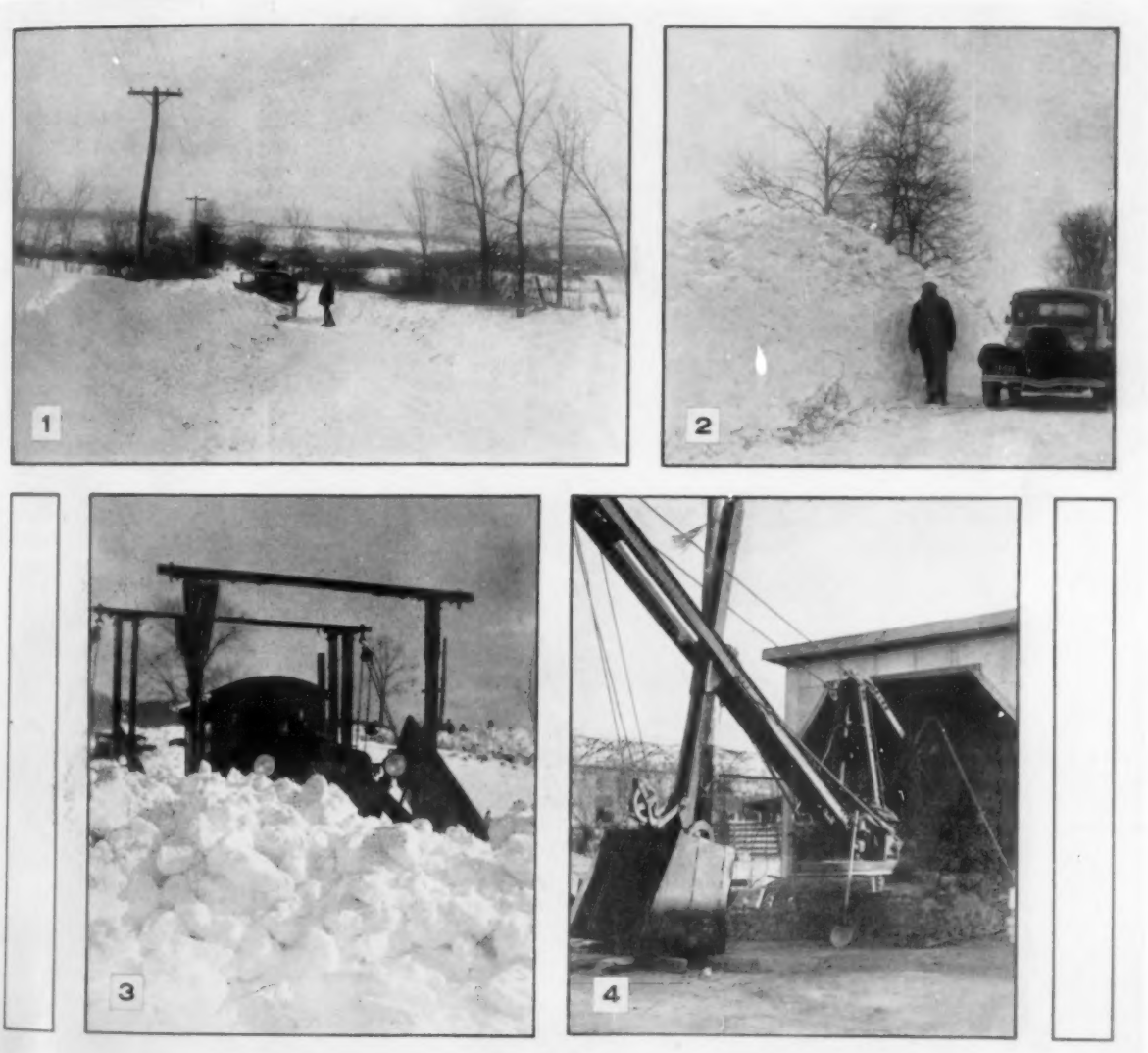
The hardest part of this problem is to accomplish all the results demanded at a reasonable cost that will be within the limits of the restricted budgets of recent years.

The city of Rutland, with 60 miles of streets, has been improving the snow-plowing service without increased expense. The total cost of plowing and sanding all streets and removing snow from the business section has been as follows:

	Plowing and Snow Removal	Sanding	Equipment Repairs	Total
1937.....	$1,097.09	$1,392.36	$126.75	$2,616.20*
1936.....	2,970.39	1,254.98	163.94	4,389.31
1935.....	1,599.70	1,049.86	577.33	3,226.89
1934.....	2,539.14	1,480.53	324.49	4,344.16
1933.....	1,477.77	584.90	203.80	2,266.47

* Plus $1,150 for a new tractor plow.

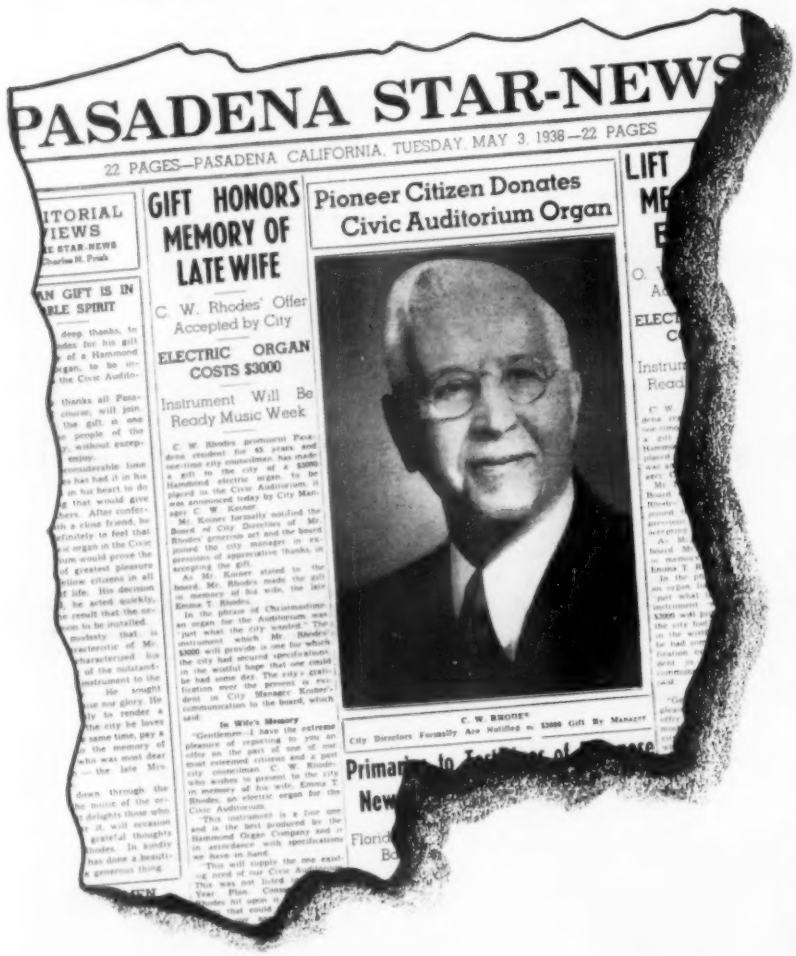
The snowfall has varied from 36 to 81 inches during



SNOW-HANDLING EQUIPMENT AND PROBLEMS IN RUTLAND, VT.

1. A Sargent one-way plow on a Chevrolet truck widening a roadway through drifts. 2. Deep frozen drifts with banks too high to be pushed back by plow. These had to be shoveled by hand. 3. This photograph shows the depth of snow plowed by the tractor plow. 4. A 1-yard snow-bucket on a ¾-yard power shovel for use in drifts and for picking up snow from piles in the streets

Tremendous interest is added to all public gatherings by a municipally-owned HAMMOND ORGAN


PASADENA STAR-NEWS

22 PAGES—PASADENA CALIFORNIA, TUESDAY, MAY 3, 1938—22 PAGES

GIFT HONORS MEMORY OF LATE WIFE

C. W. Rhodes' Offer Accepted by City

ELECTRIC ORGAN COSTS $3000

Instrument Will Be Ready Music Week

Pioneer Citizen Donates Civic Auditorium Organ

C. W. RHODES

City Directors Formally Are Notified of $3000 Gift By Manager

THE COMMUNITIES which already own Hammond Organs are finding them invaluable . . . in dozens of ways. Meetings and concerts in civic auditoriums attract enthusiastic crowds when organ music is available for every program. What's more, the Hammond can be moved from *place to place*—it is not permanently installed. Two men can carry it anywhere and it is ready to play wherever there is an ordinary electric outlet. Thus your community Hammond can add interest and pleasure to public gatherings *anywhere in the town* . . . at schools, playgrounds, parks, beaches, athletic contests, etc.

This remarkable instrument produces an incredible variety of instrumental effects; it has been called "an orchestra in a four-foot square." Eminent musicians praise the exquisite tone of the Hammond; it is used in great symphony orchestras, and in hundreds of schools and *thousands* of churches, here and abroad.

Yet the Hammond Organ costs only a *fraction* of what you would expect to pay. Get in touch with your nearest Hammond dealer today. Or for full information, write the Hammond Organ, 2981 N. Western Ave., Chicago. In *Canada,* address Northern Electric Co., Ltd., Montreal.

$1250 and up, depending on size of installation.

THE HAMMOND ORGAN
2981 N. Western Ave., Chicago
(*In Canada,* address Northern Electric Co., Ltd., Montreal)

Gentlemen:

Please send me full information about the Hammond Organ.

Name .....

Address .....

City .....

State .....

● Uses no bulky pipes or reeds . . . produces lovely tones by electrical impulses. Fits in a four-foot square. Uses negligible amount of current. Positively **cannot** get out of tune.

The HAMMOND ORGAN

the past ten years, usually about four major storms each season. All plowing is done with city-owned equipment, consisting of two large reversible-blade truck plows, a small V truck plow, two small one-way truck plows, one V tractor plow, six horse-drawn sidewalk plows, and one tractor sidewalk plow.

Hitting the Storm

Work usually starts at night. If the snowfall has reached 6 inches before 2 A.M., the truck crews are called out. The two Mack AC trucks with Good Roads Champion blade plows clean the business section, putting all the snow on one side of the street if possible, where it is picked up by hand and loaded into trucks to be drawn away. We have found that the best method of doing this is to put as many fleets of trucks and shovelers to work as the quantity of snow will warrant, so as to get the entire business section cleaned up in two or three days. The average working unit consists of three 2-yard trucks or two 4-yard trucks and seven or eight men to load. We normally use three of these squads.

While the large plows have been plowing in the business section, which takes from 2:30 A.M. to 7 A.M., there are two smaller units plowing all the main routes through the city. These consist of a Ford and a Chevrolet truck, both with Sargent plows. A V plow is used to break through deep snow, and one-way plows for widening out or for light snow.

At 7:30 A.M. all four units start out on regular scheduled routes which cover all the streets in the entire city. By the end of the first day all streets are open, and if the snow is sufficiently deep, the second day is spent widening out the first day's work.

For deep snow and drifts we have a Caterpillar Twenty-eight tractor with Sargent V plow equipped with two wings. This unit works on the outlying streets where deep drifts are most likely to occur and where trucks might have difficulty getting through, because steep grades and narrow roads do not permit sufficient speed.

I have described the general procedure for an average storm. It is sometimes necessary to make some changes. In the downtown section, if the snow is wet and the weather turns cold before it is all picked up, it may be necessary to use a road grader to scrape up the hard layer of snow that will be left after the first day. We try to clean the streets in the business section as nearly as possible to the pavement to prevent the accumulation of ice in the gutters. This entire procedure takes two, three or sometimes four days, and then with the next storm starts all over again.

Sidewalks—Loading—Sanding

Sidewalks are plowed by six plows drawn by horses and one tractor plow, all working in specified areas. The tractor is new, and in time it is quite possible that horse-drawn plows will be eliminated.

Last winter we built a snow-bucket of about 1 cubic yard capacity to be used on a ¼-cubic-yard power shovel. This is intended for picking up snow in the business section and for cutting through hard-packed drifts, but lack of snow in 1937 prevented us from trying out this unit.

During recent years, the work of sanding icy streets is requiring more and more attention. This follows immediately after plowing and also after sleet storms. Sand with calcium chloride added, about a bag to the cubic yard, is spread on all hills and intersections when needed; and when extremely icy conditions prevail, it is required on all principal traffic routes. The work of sanding intersections and sidewalks is done by hand, while streets are sanded with a Burch motor-driven spreader.

Some snow-fence is used to prevent drifts, but there are many places where this is not possible and repeated plowing must be kept up until the drifting stops. Even this has failed at times, and as a last resort some sections must be opened up by enough hand shoveling to help the plows break through.

All the work described, as well as the maintenance of equipment, has been done at an average cost of about $3,560 per year. The only costs not included are new equipment. We have been improving this as much as possible during recent years, buying about one new unit each year. I believe that our present equipment is about as efficient as possible for a small city such as Rutland. The only change contemplated in the near future is the possible elimination of horse-drawn sidewalk plows.

WPA Recreation Program Stimulates Local Action

THE recreation program of the Works Progress Administration has served as a stimulus to the initiative of most municipal recreation bodies and has inspired steady increases in local expenditures for recreation purposes, Eduard C. Lindeman, Director of the Division, reports, as the result of an analysis of data published by the National Recreation Association in its annual year book.

A study of expenditure trends in 148 representative cities over a period of the last three years shows an increase of 22 per cent in municipal appropriations devoted exclusively to recreation. Salaries to directors, leaders, counselors, etc., increased 12.3 per cent.

"Communities are not throwing the whole burden of recreation on the WPA as some authorities feared they would," Mr. Lindeman declared. "Instead, there is every evidence that they are becoming more aware of the vital place of recreation in community life, and are expanding their facilities independently of the WPA or other Federal agencies. Many cities which never had an organized recreation program prior to the inception of the WPA have now installed such programs on a permanent, full-time basis. Others have materially expanded existing programs by the addition of salaried personnel or the improvement of facilities.

"One of the chief aims of the WPA recreation program is to provide just such a stimulus, to the end that public recreation may become universally recognized as an integral part of community life."

An interesting sidelight revealed by the study is that recently smaller cities, those under 25,000 population, have been more aggressive than their larger neighbors in making independent provisions for recreation. For leadership, the average annual per capita expenditure for the period was 40 per cent greater in cities under 25,000 population than in the largest cities, and 30 per cent greater than in the middle-sized cities. For all recreational purposes, the average annual per capita expenditure for the period was 53 per cent greater in the smallest cities than in the largest cities, and 55 per cent greater than in medium-sized cities. Mr. Lindeman points out that small cities traditionally have given less thought to organized recreation than large metropolitan centers with their population congestion. The data indicate, however, that smaller communities have begun to recognize the need for public recreation programs.

ACTION ON THE JOB . . .

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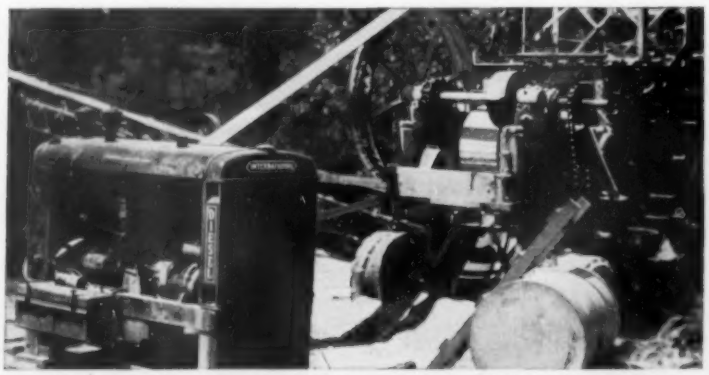

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Water Content of Materials Incinerated

By J. W. VAN DENBURG
Department of Public Works, New York City

WHEN discussing the incineration of sewage solids, in particular, the theoretical limits for various burning cycles, similar to the limits found in the studies made in other heat processes such as power generation, should be considered. One of these limits is the highest moisture content in the material to be burned at which any particular cycle will work continuously.

One method of studying some of these cycles assumes certain constants approximating those met in operating conditions, disregarding the ever present but variable losses and shortcomings of the different pieces of equipment which are or might be adapted to the different steps, and then comparing the theoretical limiting results on the basis of the highest moisture content at which the cycles will balance out.

The basic assumptions, which are subject to modification by choice, local conditions, and more complete data are: perfect combustion; fully effective heat exchangers; no radiation losses; a temperature zone of 1,400 degrees Fahrenheit through which all gases pass; 8,000 Btu per pound of ash and moisture free combustible; 30 per cent ash; 12 pounds of air per pound of combustible unless excess is purposely assumed; 0.25 specific heat for all gases and solids except water and steam; and other constants as generally used.

In a first case the material is fed steadily into an incinerator and burned, the discharge from the stack passing off directly. Under the assumptions made, the burning would continue up to a moisture content of about 60 per cent.

A second case is where the air is preheated to as high a temperature as the assumptions permit and a less amount of heat consequently passes out of the stack. Under these conditions the limiting moisture content is a little over 70 per cent.

When the moisture content reaches this range, it is frequently customary to resort to two other means of helping combustion. Part of the water may be removed by mechanical means, before putting the material into the incinerator. This requires some power and equipment. In the second, enough heat is added by means of auxiliary fuel to make up for the deficiency in the material itself. The simplicity of this method sometimes makes it attractive. Combination of the two methods is of course another variation.

There is, however, a possibility of bringing the limiting percentage of water to a point higher than 70 per cent, without filters or auxiliary fuel, by further combinations of heat handling apparatus, thus making use of these other aids to a less extent. From a theoretical standpoint it appears that a limit of about 85 per cent is possible, this limitation resulting from the necessity of discarding an amount of heat equal to the latent heat of the moisture, unless mechanical work or its equivalent is added. In fact, under the assumptions above mentioned, with varying air, cycles can be worked out using the heat of the flue gases to raise the temperature and vaporize the moisture of the wet material and to preheat the air, to permit a balance with an 85 per cent water content in the material to be burned. This would necessarily be reduced in practice, depending upon the lack of perfection of the apparatus.

It is emphasized that these results are theoretical comparisons only, but may have, nevertheless, their importance, always providing that apparatus can be devised for their practical application.

Insulating Refractories for Incinerators

By S. M. JENKINS
Armstrong Cork Products Co., Building Materials Division, New York City

INSULATING brick were brought on the market in 1913. These early insulating brick were used behind the firebrick, generally between the firebrick and the outside red brick or concrete wall. They were sawed out of natural diatomaceous earth or made of a porous clay and cork mixture. Porosity is secured by burning the cork out of the brick. These products have gradually been improved so that now they are replacing firebrick in various ways. The new insulating refractory brick will stand the destructive effects of the increased rates of combustion and higher temperatures.

Insulating firebrick were first used directly exposed only in electric furnaces. Later they were used directly exposed in gas-fired furnaces. By close study and constant improvements they have now reached a point where they are used directly exposed for oil-fired furnaces, powdered-fuel fired furnaces, and, in fact, exposed practically to any combustion. Care should be taken, however, that the brick are not subjected to higher temperatures than those for which they are intended. Furnace conditions can be of neutral, reducing, and oxidizing atmospheres. This statement is made after having checked installations that have proved satisfactory over five years. The time element has been the only one that has not been proven before now.

Insulating firebrick have made possible the use of thinner and lighter hanging walls and flat arches. This permits greater use of steel for holding the settings together and for steel-encased equipment. To seal the walls, it has been found that a good refractory cement seals the joints

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and knits the porous brick into a monolithic mass, the cement, of course, being one that expands and contracts with the insulating firebrick. Ramming mixes have also been used successfully as a facing. Development of heavier facings for insulating refractories has offered some encouragement for facings of various thicknesses. Facings can be so constructed as to hold the desired amount of heat in the furnace and no more, and offer a flexibility that is impossible with standard thickness refractory materials.

Insulating firebrick have proved their adaptability for certain sections of incinerators. It was found that in the combustion chamber, flues, and waste heat boiler sections of an incinerator all slagging was eliminated by the use of directly exposed insulating refractory brick. This is due solely to the fact that the insulating refractory brick have such a low heat storage and, consequently, such a low heat wall temperature that fly ash will not flux to it. This is not the case where heavy firebrick walls are used, for they build up such a high face temperature that the fly ash fluxes to the brick as soon as it touches it.

Uniformity of insulating firebrick is of greater importance than in the heavier firebrick materials because of the thinner wall constructions where insulating firebrick are used. Shrinkage of the insulating firebrick should be low, the structure free from checks, cracks, voids, stratifications or soft centers, and the structure of equal strength when laid flat or on edge. Expansion should be eliminated as much as possible, for none of the insulating firebrick is as strong as firebrick.

Resistance to spalling is necessary, for most insulating refractory brick are used in intermittently operated furnaces. The principal demand made on these brick is to allow a furnace to be brought up to temperature in a very short time. Physical strength at high temperatures should be ample for all constructions, especially in arches. Pilasters and projecting flues call for extra strength in the brick, for expansion of the walls means that the brick are carrying these projections along with them.

Insulating efficiency is not the principal item in an insulating firebrick but should be the highest possible. The over-all ratio between walls of insulating firebrick and firebrick should be about 6 to 1 in the matter of heat storage and insulating efficiency. No method of taking conductivity has been approved as standard by the American Society of Testing Materials on insulating firebrick materials, so there is no standard of comparison in the conductivities of these materials.

The fusion point should be high enough that a sudden peak of furnace temperature does not cause softening of the insulating firebrick. Modulus of rupture is of importance in some furnace constructions and should be close to 100 pounds per square inch. Price, of course, plays a part in the selection of these materials. Therefore, it is suggested that before anyone decides upon materials of this nature a specification be drawn up covering all these points.

With this information, any user of insulating refractory materials for municipal incinerators will be able to gage the best and most practical materials for each purpose.

EDITORIAL NOTE.—The two articles immediately preceding were presented in a discussion of papers on the incineration of municipal refuse read before the Sanitation Group, American Society of Mechanical Engineers, and published in THE AMERICAN CITY, February-May, 1938. See other discussions in July and August issues.

Demolition, Vacation or Repair of Substandard Buildings

A TIMELY report of the Institute of Law Officers entitled "Demolition, Vacation or Repair of Substandard Buildings in Connection With Housing Programs," presents the actual experience of 21 cities along this line and includes a suggested model ordinance incorporating the best features of all the ordinances studied. Following are quoted the two introductory sections of this ordinance:

1. *Dangerous Buildings Defined.*—All buildings or structures which have any or all of the following defects shall be deemed "dangerous buildings":

(a) Those which list, lean or buckle to such an extent that when a plumb-line drawn together through the center of gravity falls outside of the middle third of the base of the structural part so listing.

(b) Those which, exclusive of the foundation, show 33 per cent or more of damage or deterioration of the supporting member or members, or 50 per cent of damage or deterioration of the non-supporting enclosing walls or covering.

(c) Those which have improperly distributed loads upon the floors or roofs or in which the same are overloaded, or which have insufficient strength for the purpose used.

(d) Those which have been damaged by fire, wind or other causes so as to have become dangerous to life, safety, morals, or the general health and welfare of the occupants or the people of the city of .....

(e) Those which have become or are so dilapidated, decayed, unsafe, insanitary or which so utterly fail to provide the amenities essential to decent living that they are unfit for human habitation, or are likely to cause sickness or disease, so as to work injury to the health, morals, safety or general welfare of those living therein.

(f) Those having light, air, and sanitation facilities which are inadequate to protect the health, morals, safety, or general welfare of human beings who are or may live therein.

(g) Those having inadequate facilities for egress in case of fire or panic or those having insufficient stairways, elevators, fire escapes, or other means of communication, light or ventilation.

(h) Those which have parts thereof which are so attached that they may fall and injure members of the public or property.

(i) Those which because of their condition are unsafe, insanitary or dangerous to the health, morals, safety or general welfare of the people of this city.

(j) Those buildings existing in violation of any provision of the building code of this city, or any provision of the fire prevention code, or other ordinances of this city.

2. *Standards for Repair, Vacation or Demolition.*—The following standards shall be followed in substance by the Building Inspector and the Building Commissioner in ordering repair, vacation, or demolition:

(a) If the "dangerous building" can reasonably be repaired so that it will no longer exist in violation of the terms of this ordinance, it shall be ordered repaired.

(b) If the "dangerous building" is in such condition as to make it dangerous to the health, morals, safety, or general welfare of its occupants, it shall be ordered to be vacated.

(c) In any case where a "dangerous building" is 50 per cent damaged or decayed, or deteriorated from its original value or structure, it shall be demolished, and in all cases where a building cannot be repaired so that it will no longer exist in violation of the terms of this ordinance, it shall be demolished. In all cases where a "dangerous building" is a fire hazard existing or erected in violation of the terms of this ordinance or any ordinance of this city or statute of the state of ....., it shall be demolished.

(See p. 95 of the August issue of THE AMERICAN CITY.)

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Municipal Asphalt Paving—Trends and Construction Practice—Part I

By W. R. MACATEE
District Engineer, The Asphalt Institute, Cincinnati, Ohio

BY far the most pronounced trend revealed by the answers received is the tendency shown by municipal authorities to turn to low-cost asphaltic types to meet the public's insistent demands for year-round pavements. With the use of low-cost surfaces and base courses, vast areas in residential sections—which were previously regarded as beyond the financial ability of American cities to completely pave—are fast becoming as well surfaced to meet traffic requirements as the older and more abundantly tax-producing business areas.

This trend to low-cost surfaces was originally limited to road-mix types on existing gravel and stone bases. The need for competing with road-mix types has, however, stimulated plant operators to effect tremendous and previously unthought-of economies by which plant-produced mixtures are now being turned out at a cost within a price range which city officials are often willing to pay, there being relatively only a slight difference. By plant-mix methods, with usual controls to be found on plants, asphalt mixtures can be produced more in accordance with predetermined designs than is sometimes possible with road-mix methods. As the costs of plant-produced mixtures come within reasonable competing cost of road-mixes, cities are turning more and more to them. However, road-mix methods are still used to a much greater extent than plant-mixes.

Dense Graded Aggregate Popular

The dense graded types of aggregate similar to the almost perfectly graded sand-gravels—such as are found in Michigan and many other sections of glacially formed regions—have been used very largely in low-cost asphalt pavements. Liquid asphalts, consisting principally of the medium-curing and slow-curing groups, have been the principal binders for this type of construction. The rapid-curing and the emulsified types of liquid asphalt have also been largely used. Rapid-curing cutback types of liquid asphalts have served chiefly, however, as binders in the macadam type of aggregates rather than in dense, graded, sandy gravelly types.

Practice in Michigan Cities

Lansing, Detroit and a number of other Michigan cities have used these low-cost types to pave sections which were previously considered permanently to remain as unpaved areas. Lansing paving authorities report excellent results from these plant-mix, low-cost surfaces. That city's mixture consists of dense graded aggregate which is characterized by the fact that at least 55 per cent passes the No. 10 sieve, and all the aggregates pass the 1-inch screen. Mineral filler is added so that the 200-mesh material consists of 5 to 10 per cent of the aggregates. The liquid asphalt of the slow-curing group represents 4½ to 5½ per cent, by weight, of the entire mixture. This is produced in a twin pug-mill type plant, all the aggregate being thoroughly dried and the liquid asphalt heated to 160° F. The compacted thickness is usually 2 inches on a 6-inch gravel base. The 1937 records show this type of surfacing to have cost the citizens of Lansing 38 cents per square yard, in place.

Cities in California and other western states have also used the oil-aggregate type of construction very extensively. Road-mix methods producing these mixtures undoubtedly dominate over the somewhat more expensive plant-produced mixtures throughout the country.

Experience

This paper represents the composite experience of the author and majority opinions expressed in answers to a questionnaire sent to municipal paving engineers, throughout the United States. It thus presents the usual technique, types and methods, but not the universal opinion, for these all vary somewhat with the locality.

Trend to Softer Asphalts

Another pronounced trend is toward the use of asphalt cements of somewhat higher penetration than those formerly used. Softer asphalts are being employed more and more extensively in plant-mixes, especially in hot-laid asphaltic concrete and sheet asphalt. In many cases 85 to 100 penetration asphalt is used.

Municipal paving authorities are in agreement with a number of other qualified asphalt technologists that all asphalts—both the solid and the liquid kinds—tend to harden with age, and that there is a definite relationship between the hardening of asphalt and the development of cracks in asphalt pavements. It has, however, also been made apparent that this is not the sole cause of cracking of pavements, and that this may be due to one or more causes. These additional causes have been listed as follows:

(a) Cracks in foundations which reproduce themselves in the wearing course
(b) Faulty design of the mixture
(c) Incomplete and faulty compression
(d) Unduly low asphalt cement content
(e) Excessively high temperatures in preparing mixtures
(f) Porous or high voidage after compressing asphalt mixtures

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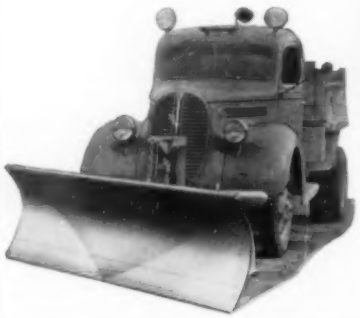

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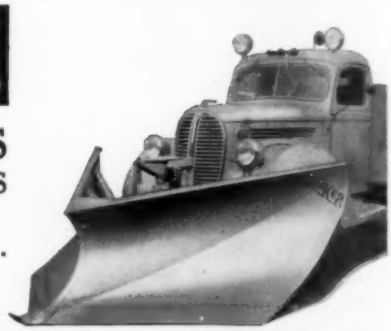

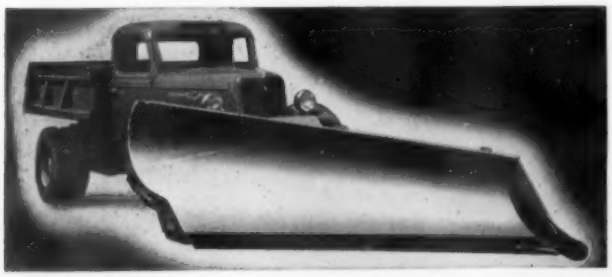

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Crack-Free Pavements

Hubbard and Gollomb epitomize five excellent rules which should be strictly observed in overcoming the development of cracks in asphalt pavements. These investigators' summary of good construction practice is worthy of repeating in this paper, as well as elsewhere. Already, however, a large number of paving engineers from whom replies were received, showed—by implication at least—a general trend toward following the rules enumerated by these authorities, which are summarized as follows:

I. Use as soft an asphalt as possible without reducing stability below the minimum required to prevent displacement under traffic.

II. Use as high a percentage of asphalt as possible, without reducing stability below the minimum required to prevent displacement under traffic. In this way film thickness is increased to the maximum practical extent and air permeability decreased.

III. At paving plants prepare mixtures at the lowest practicable temperatures.

IV. Compress all asphalt paving mixtures thoroughly so that they will be as impermeable to air as possible.

V. Seal-coat all compressed mixtures which are readily permeable to air, and thus prevent free circulation of air within the mixture.

Joints in Bases to Reduce Cracks

Asphalt paving technique has developed to a high degree of perfection in cities. Nowhere, however, are improvements sought more eagerly than in the nation's capital at Washington where asphalt has been so extensively used since 1876. The long experience with asphalt in that city plus skill shown by paving engineers there in the matters of design and supervision, has attributed limited cracking of asphalt pavements in that city to the formation of cracks in the foundations and reproduced in the surface. Paving authorities in the nation's capital have greatly reduced the number of cracks by constructing planes of weakness at 15-foot intervals in their bases. The few cracks which do occur are straight and quite narrow, requiring no maintenance.

Crack-Filling Material

As a substitute for hard asphalts previously used for repairing cracked and unsightly surfaces, many maintenance authorities are now using liquid asphalt for restoring cracked surfaces to normal structural value and appearance. These engineers are turning more and more to MC-1 as the bituminous material best suited for sealing and restoring the structural soundness of areas where cracks have formed. This trend away from hard paving asphalt, which required heating before pouring, has been brought about because of (a) the "bridging action" of the hot asphalt, (b) assurance that penetration can be had with MC-1 cut-back asphalt to the full depth of the cracks, and (c) avoiding the objectionable excess of bitumen when hard asphalts are used. Hard asphalts cause roughness and decreased skid-resistance, due to excessive quantities over the surface.

Air-Curing Required

The use of liquid asphalt for crack-filling shows that excellent results are secured by pre-mixing dry, fine aggregate (all passing No. 10 sieve, and 80 per cent passing No. 20 sieve) with 6 to 8 per cent of MC-1. This is equivalent to 125 to 100 pounds of sand for each gallon of MC-1. It has been found that after the dried sand is entirely coated, the mixture should be air-cured for 24 to 48 hours. It is then vigorously hand-broomed into the cracked areas, completely filling the cracks. Maintenance operators report that, prior to brooming, the cracks should be thoroughly cleaned by compressed air and should be dry. For further curing to allow the liquid asphalt to become cementitious, at least 72 hours are allowed to elapse after filling the cracks and before the entire surface is given a light surface treatment of RC-1 and 20 to 25 pounds of clean, dry torpedo sand per square yard.

Replies received show that the quantity of RC-1 for surface treatment after the crack-filling operations are completed should not exceed 0.1-gallon per square yard. After applying the RC-1, the fine aggregate should be thoroughly broomed over the surface with a broom drag.

The practice of using liquid asphalt for crack-filling and surface treatment using fine aggregate, has the advantage of restoring the surface to a pleasing appearance and also producing a highly skid-resistant surface.

Prepare Mixtures at Low Temperatures

It was rather surprising that a few paving engineers made known in their replies that maximum permissible temperatures for producing hot-mixed types are not always observed. Most replies received, however, showed that the majority of paving engineers are alive to the need of keeping mixing temperatures below the coking point. The replies also indicated that electric recording pyrometers are being required more and more. With these instruments, this important construction requirement can be more effectively controlled.

Even for long hauls, it is not necessary to run the temperature of asphalt hot-mixes above that required to produce proper mixing; 300° F. is usually sufficient for sheet asphalt, and 225° F. for asphaltic concrete. These temperatures can be maintained by the use of insulated trucks. Observance of these maximum temperature limits will aid appreciably in prevention of cracking of asphalt pavements.

ACKNOWLEDGMENT.—From a paper presented before the Municipal Division at the 1938 Road Show and Convention, Cleveland, Ohio.

(To be continued in the October issue)

To Modernize City Licensing

A CENTRAL licensing office and a central file for licensing all necessary businesses and occupations are suggested in a study made by C. C. Ludwig, Executive Secretary of the Minnesota League of Municipalities and reported in the August issue of *Public Management*, magazine of the International City Managers' Association. The centralized system would fix responsibility with one individual and also provide central records containing the history of licenses, fees, inspection reports and complaints.

Mr. Ludwig asserts that the city council, rather than the administrator, should determine such policies as selection of types and classes of business to be licensed, restrictions and standards which shall govern licenses, amount of fees, and the duties of administrators.

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The Effect of Trade Wastes on Sewers and Treatment Works

By STANLEY SHUPE
City Engineer, Kitchener, Ontario

ORGANIC material is limited on the earth's crust, and we are familiar with nature's methods in changing the state of these elements for constant re-use, as shown diagrammatically below for nitrogen, carbohydrates and sulphates.

Upon death the protein of animal life is attacked by organisms which by putrefaction and other processes reduce or decompose this complex substance to its elemental factors, such as ammonia nitrites, H_2S, sulphur and carbon dioxide, which in turn by oxidation, nitrification and proper conditions of sunlight, warmth and moisture, are assimilated by plant life, forming food for animal life, and finally, the proteins thereof to complete the cycle.

Sewage-treatment plants are the artificial aids to nature's general cycle of conservation, and the sewers provide the transportation, so that the processes may be centralized and nuisances avoided.

Engineers and plant operators experience the minimum difficulties in designing and maintaining treatment works for domestic sewage; procedures are practically orthodox, and the line marked "digestion" on the nitrogen cycle indicates that partial treatment has already been effected.

With the addition of trade wastes, the problems increase according to the character of the wastes and their proportion of the total flow. Although septic or anaerobic activity is frequently employed as part treatment, final purification must be effected by oxidation. Oxygen is therefore the prime requisite, and the amount required is the most applicable gage of comparative strengths, with a few exceptions wherein a material may be decidedly objectionable for other reasons such as dyes, acids or oil.

The Biochemical Oxygen Demand of a polluted water, a sewage or an industrial waste is the amount required for the stabilization of its organic matter by aerobic bacterial action.

For ordinary domestic sewage the 5-day B.O.D. ,per capita has been established as 0.167-pound. Applying this factor to the wastes from the meat-packing houses, tanneries and corn-product industries of Chicago, it is shown that these wastes have a population equivalent of 1,500,000. North Adams, Mass., with an actual population of 22,000, has an industrial waste equal to four or five times the domestic sewage, but only a small portion is admitted to the sewers.

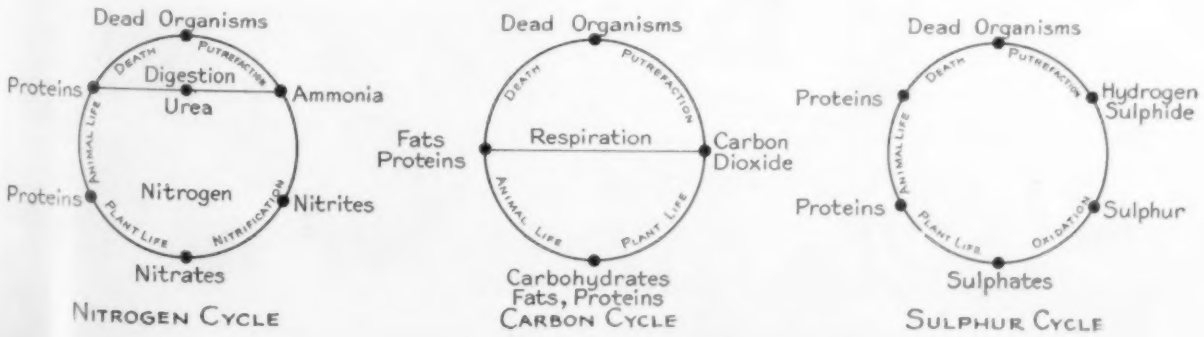
Eight-hour tests during the color and volume peak at Kitchener showed a 5-day B.O.D. of 550 ppm. This amounts to a city population of 124,440, or 3.8 times greater than actual.

These are abnormal examples, but indicate in general the tremendous difference in sewage. The following discussion is based on the experiences in Kitchener rather than from the extensive bibliography available.

Tanneries

A municipality should not object to increased volume of flow unless it be on account of the disproportionately small percentage of total tax of a wet-process industry which is ear-marked for sewage purposes. We have had occasion, however, to charge 50 per cent of a new 18-inch sewer to a tannery for increased line capacity when it was established in a former furniture factory building which had had satisfactory service, along with several dwellings, from a 9-inch pipe. The character of a waste, however, must be checked and, whereas it is cheaper to treat this type of sewage at a central point (sometimes its alkalinity is useful as a neutralizer in co-precipitation with acid metal-plating or pickling liquors), especially when the firms are located in built-up districts, it is a practical necessity to have the trade waste pretreated by the manufacturer, at least to a fair degree, so as to be comparable to domestic sewage by at least preliminary screening and settling. Even so, cleaning of sewers with drag-buckets is often found necessary in the outlet sewers and many cubic yards of accumulations removed for several blocks below a tannery.

The vegetable tan process consists of treating the hides with an extract of bark, and the spent liquor therefrom is highly colored; and, while this factor does not affect the treatment process, a relatively large amount spoils the



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appearance of the effluent in all plants unless chemicals or slow sand filters are employed. Bottoms of streams below the treatment works are stained by this pernicious color.

Suspended solids of over 3,000 ppm may be expected, creating a large volume of sludge, and the high organic content places a heavy load on any secondary treatment unit. The presence of hair, especially when added to fibers from felt works, has a tendency to float in digester tanks instead of settling, resulting in necessity for manual removal. The hair content in the sludge, however, hastens drying and aids handling from sludge beds. Glue factories have much the same waste less the color.

In 1922 a workman, failing to interpret the warnings of blue-tinged concrete and disintegrated iron steps, entered (without a fresh air mask) a manhole common to a tannery and felt and dye works and was killed by asphyxiation. The gas was analyzed as hydrogen sulphide.

The chrome tan process makes use of a solution of chromic acid and, whereas the suspended solids would not be expected to range over 2,000 ppm, the resultant sludge is messy and slow-drying.

Meat-Packing Plants and Dairies

In this case settling and grease-traps are essential. Unfortunately, the latter lose their efficiency as the temperature of 68° F. is exceeded, and more waste is received in hot weather exactly when low water in streams requires the highest degree of sewage treatment.

The settling tank will collect large quantities of paunch manure but fails to precipitate the colloids, mostly proteins and fats, and the effluent appears either whiteish or red if killing-floor washings are entering.

In all cases it is very important to dispose of the cleanings, in solid or liquid state, regularly.

Stale doses are in a state of alkaline digestion, which causes bulking of activated sludge.

In hot weather, this rich waste mixes in the sewer flow and may cause very vigorous decomposition, producing H_2S so that odors come up through the manholes and disintegration of sewers is fostered.

By the use of chlorine and a second clarifier, a reduction of the 5-day B.O.D. may be effected from 3,000 to 150 ppm. Should, or can, a municipality demand this much?

Again the character of the sewage is more important than the volume, but in this case skimming is about all the preliminary treatment practical without going into a biological system, since most of the organic content is in the form of colloids. If the industry was large in proportion to the contributory population, a private trickling filter system would be justified; usually, the firm would oppose the required expenditure and perhaps not have an employee skilled to operate it.

In the meantime, economics in the factory, such as steaming out the last bit of cream from the can, helps the firm and the municipality. Milk wastes carry 1,000 ppm 5-day B.O.D., which, however, is five times that of domestic sewage and particularly affects the effluent requirement on plants having settling only. Also, lactic and other organic acids quickly form and inhibit bacterial growths on filter media. Other carbohydrates or fermenting wastes which are in this class and are detrimental to biological processes are alcohol, brewery wastes, starch wastes and vegetable canning.

Recent experiments on 251 industries show that distillery wastes require 470 times more oxygen and contain 181 times more suspended solids per employee than the water-carried household wastes of the ordinary individual, and are several times greater in these units than from any other industry. It does not take a very large percentage of such an effluent to kill fish in a stream.

Gas Manufacturing

Most municipalities have an illuminating gas plant where usually both water gas and coal tar gas are sold, together with the coke and tar by-products. The gas is purified by rising in a mist or spray of water. This waste, containing phenols, ammoniacal compounds and some tar oils, is especially odorous and is inhibitive to bacterial action in sewage plants. Cinder or excelsior filters are insufficient protection to sewers, for the black deposits soon line the peripheries of pipes, and manholes must be trapped for odor control. Turning such liquor into open streams produces colored and oily surfaces and unsightly shores.

Whereas it is the duty of a provincial or state board of health to enforce such a degree of sewage treatment as required to keep well within the recuperative powers of streams, and rightly so, why should not standard government regulations be formulated in the same interest to control the wet process industries directly? For example, compulsory filtering, cooling and re-use of gas wash water, and no effluent permitted, should be required, since they are practical and feasible. At present sewage-disposal plants must be built in much more costly manner owing to the absence of such restrictions.

The main oxygen-consuming constituents of gas liquors are phenols, and the chief processes of purification in biological filtration are the oxidation of the bulk of the phenols and the nitrification of part of the ammoniacal compounds.

Digested sludge contains ammoniacal compounds which react chemically with ferric chloride and similar coagulants so that gas-house wastes increase the need for elutriation of digested sludge in case a filter system is in use.

The addition of wastes increases the H_2S, which leads to increased corrosion in gas lines and burners.

Gas leaks in mains should be corrected as soon as detected, for illuminating gas may find its way into sewers and, reaching an explosive mixture in manholes, may explode by any chance ignition.

More serious explosions have been recorded, caused by the admission of petroleum products from gasoline storage, garages, and cleaning plants. Oil is particularly undesirable owing to its specific gravity and adhesiveness. It increases the volatile content and is a serious factor in lifting sludge to the top of digester tanks.

Conclusion

The industrial waste problem is of great urgency and warrants a careful study and the preparation of a schedule of preliminary treatment and of the degree thereof to be required of industries in all municipalities which are forced to use secondary treatment in the prevention of stream pollution.

ACKNOWLEDGMENT.—From a paper presented at the Fourth Annual Convention, Canadian Institute on Sewage and Sanitation.

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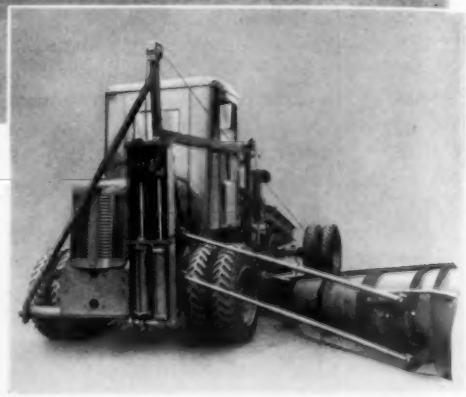
The V-Type Truck Plow illustrated above, is widely used for state, county and city work throughout the snow belt.



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Effect of Subsurface Structures on City Paving—Part II

A Series of Helpful Reports from the United States and Canada

W. W. Tarr, Principal Draftsman in charge of Right-of-Way Division of the Bureau of Plans and Surveys, Department of Public Works, Baltimore, Md.:

Supervision of permits for the installation of subsurface structures by city departments and public utilities has been in operation in Baltimore and many cities for years, but the supervision of systematic planning of future subsurface structures is a comparatively new problem. In issuing permits, rules and regulations were prepared and inspection of work furnished, but the preparing of records showing location and depth was left entirely to the individual department or utility. In planning for future work, a great deal depends upon good records. In Baltimore, each department and public utility prepares its own record; other privately built structures are recorded as proposed and no finished record made. Although this method of recording has proved fairly satisfactory, a drawing showing all subsurface structures, prepared by one department or subdivision, would prove much more satisfactory.

In Baltimore, prior to 1921, each city department or public utility chose its own location, prepared its own plans, and then, often, when the work was started, found they conflicted with some other structure. Permits were issued for work to be placed in one location and changes made in location without any record being made.

This trouble and confusion was eliminated by the creation of a Right-of-Way Group in the Drafting Division of the Bureau of Plans and Surveys, a Bureau of the Department of Public Works. This group prepares right-of-way plans, assigns locations in streets, and approves for location and depth all city plans and applications for permits by private parties and public utilities in both public and private streets. Private streets are streets in which the city has no jurisdiction, so the locating of structures and the maintaining of these locations depends entirely upon the cooperation of the owners, developers, or the utilities doing the work.

By right-of-way plans, this group plans for future work in cooperation with the City Planning Commission. These plans are tracings in black ink of new streets and future streets as laid out by city planning. Structures are shown by symbols. The locations shown on these plans are approved by all city departments and public utilities interested. These locations are reserved for an indefinite period and are not changed except with the approval of the department having that location.

In assigning locations, it was found that where standard locations would work very well in some cases, in an old city like Baltimore, where it was necessary to connect to existing conditions, standard locations could be used only in new and future streets. Where standards could be used in assigning locations, the following were found satisfactory to all concerned: water mains in the center of streets, without service mains in the sidewalks, unless the street is more than 60 feet in width; gas mains 4 feet inside curb on either side of street; storm-water drains from 5 to 7 feet outside curb line; sanitary sewers in alleys 3 to 4 feet from property line; conduits 7 feet inside curb on either side of street.

L. E. James, Superintendent of Construction and Engineering, Bell Telephone Co. of Canada, Toronto, Ont.

Th five-year report by the Public Utility Coordinating Committee of Toronto received unanimous endorsement from the various public utilities and the municipal authorities. As a result of this approval, it has been decided to continue the work, particularly with respect to completing the coordinated plan showing all subsurface lines in their proper relation, one to the other, for the city of Toronto.

With respect to the use made of the completed plans, it has been the experience of the Bell Telephone Co.—and this experience applies also to the other utilities in the city of Toronto—that the coordinated plans have greatly facilitated subsurface work, and many economies have resulted through having a more accurate knowledge of the location of other subsurface structures, as shown on the coordinated plan. This information is particularly useful to the utilities when they are designing new subsurface structures, for the structures can be located where the minimum amount of conflict with other subsurface structures will occur, and where the projected line of the structure for future extensions can be carried on in a clear space which has been reserved for the utility in question. All plans for subsurface work are submitted to the members of the Public Utility Coordinating Committee and are approved by the Committee with respect to present and future location. At these meetings each utility is given an opportunity to present its case and to request provision for plant extensions, so that costly rearrangements of subsurface structures will be eliminated, or at least reduced to a minimum. In addition to the economics of such an arrangement, avoidance of interruption to the services supplied to the public by any utility or the city, is of vital importance. Through the medium of this Committee we are enabled to reduce service interruptions to a minimum with a consequent improvement in public relations. It is appreciated that, since plans for all subsurface work and laying of new pavements are discussed and agreed upon

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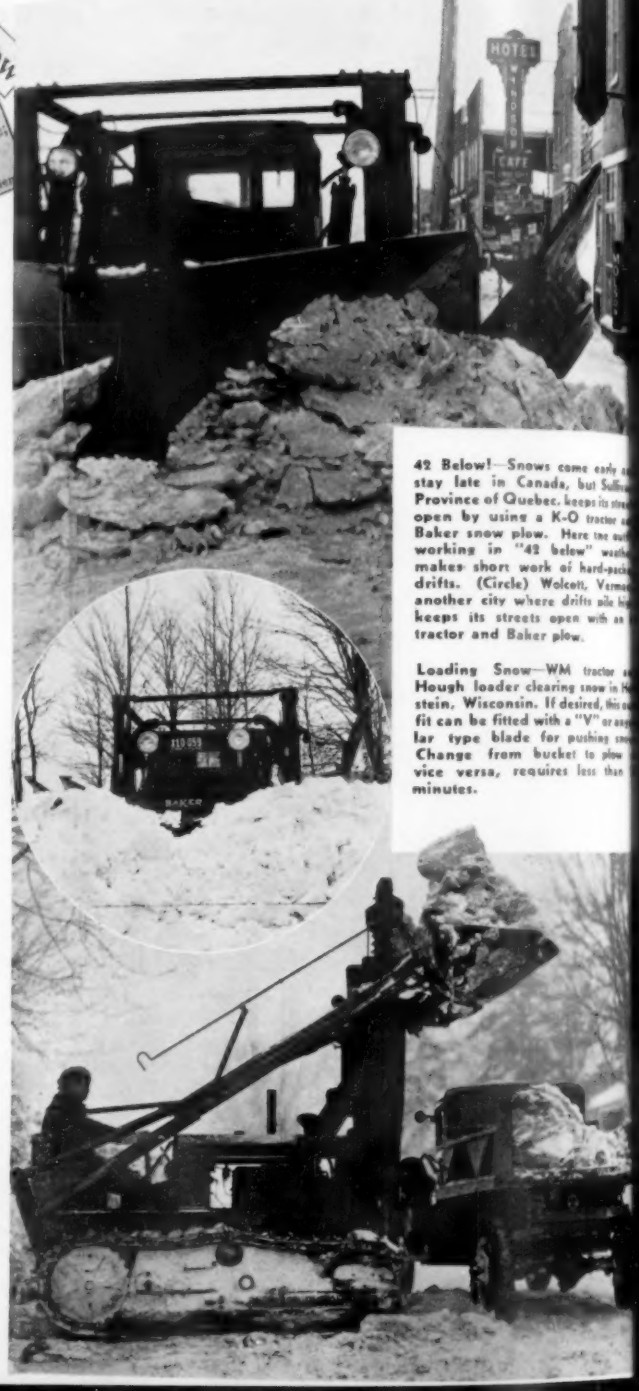

42 Below!—Snows come early and stay late in Canada, but Sullivan Province of Quebec, keeps its streets open by using a K-O tractor and Baker snow plow. Here the outfit working in "42 below" weather makes short work of hard-packed drifts. (Circle) Wolcott, Vermont, another city where drifts pile high, keeps its streets open with an A-C tractor and Baker plow.

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by the Committee, the element of planning is provided for in so far as present knowledge is concerned.

The success of any committee rests with its chairman, and we have been singularly fortunate in having as Chairman Murray A. Stewart, Principal Assistant Engineer, Department of Works, City of Toronto, who has realized the importance of this work and through his enthusiasm and interest has stimulated the Committee to greater activities, so that the monthly meetings are looked forward to, and every effort is made to obtain the greatest advantage possible from them. It seems that the regular monthly meetings of the Committee form one of the most important functions of its work, since it is during these meetings that the various utilities and the municipal authorities are able to present their problems on a common ground so that they may be considered by each member of the Committee, and after consultation a conclusion may be reached which will be in the interest of all the utilities involved as well as of the citizens of Toronto.

The following excerpts have been taken from the five-year report of this Committee, in order to show the extensive and thorough study and the value which is attached to this work by municipal and utility authorities in Toronto:

"There are, in the city of Toronto, approximately 4,548.55 miles of water and gas mains, sewers and ducts operated by the municipality, the Consumers Gas Co., the Toronto Hydro-Electric System and the Bell Telephone Co. of Canada.

"The total mileage of streets in the city is 575.32, and there are 157.78 miles of lanes; a total for all public thoroughfares of 733.10 miles.

"Subsurface structures have been laid on a great part of this mileage, and others may in the future be laid on the remainder. The present average mileage of subsurface main lines per mile of street and lane is 6.2. There are in addition several thousand miles of private drains, water, gas and other service lines, and over 60,000 manholes, service boxes, valve chambers, etc., all buried below the surface of the streets. Certain lengths of telegraph lines, pneumatic tubes, steam lines and oil lines have also been laid which are not included in the above figures.

"The absence in Toronto of any coordinated plan showing all subsurface lines in their proper relation one to the other is not a condition peculiar to this city, but is common to most of the larger cities on this continent. It follows that the larger the city, the greater the confusion, and an example of a common condition is to be seen in the photographs of some of the intersections of New York City. Imagine for a moment the effort required to identify the various lines, and later the difficulty of repair, renewal or alteration or the placing of new lines. Conceive the exasperatingly slow work of removing the grade in the first place, and the equally slow pace at which succeeding work must proceed owing to the confined space in which the men must of necessity work. Such conditions have undoubtedly rendered the planning and execution of new projects extremely difficult and have resulted in the loss of millions of dollars in the past, which must be directly charged to lack of cooperation between utility company officers and city officials.

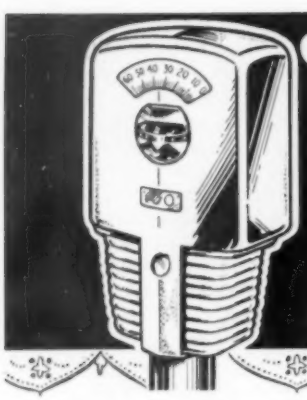
"I do not wish to give the impression that prior to the inception of the Public Utilities Coordinating Committee this city did not keep a record of underground work done by the public utilities and the Department of Works. For years, complete plans and documentary records have been kept of public works such as sewers, and water mains, and they are on file in the office of that Department. In the case of the public utilities, the Department receives applications for approval of installation of any underground work which they may require. These applications are accompanied by a number of blueprints which are distributed to the various operating sections of the Department of Works and other utility companies for examination with regard to existing or proposed underground works which may be in contemplation. The blueprints are returned to the Department of Works, either approved or with suggested alterations. By this means, a line satisfactory to all concerned is determined upon and the application is forwarded to the Administration for approval. Upon approval being granted, the utility company is duly notified and the work installed. Necessary records of the procedure are maintained and the plan filed. This system, while complete as to record of individual effort, did not contribute to a composite picture of the complex condition which exists beneath the surface of the streets. The development of a composite plan of this city's underground structures will greatly simplify the above procedure, and large savings will be effected both in the design of any project, and in the checking of it with respect to other utilities.

Composite Plan

"The type of plan to be used was a matter of major importance, and information was sought from various cities as to current practice in that regard. Not until then was it realized how little information on the subject was obtainable and how indifferent to the question have been many of the great cities of this continent. We did, however, obtain some very useful material from cities in the United States. A. M. Reid, of the Bell Telephone Co. of Canada, who obtained information from Philadelphia and Chicago, and Mr. Von Maur of the Consumers' Gas Co., who secured data from Washington, were very helpful. The city of Philadelphia, unlike other cities, had been making plans of all underground lines for many years and operated what was called a Technical Committee, comparable to the Public Utilities Coordinating Committee. A careful study of all the information obtained resulted in the adoption of the type of plan which you have seen tonight. We consider that it is better than the Philadelphia plan in that each utility is drawn to scale and is colored, rendering any one readily distinguishable from others, whereas the Philadelphia plan is a line drawing requiring very careful and extensive study.

"Having determined upon the size of the plan, it was found that there would be required approximately 4,000 plans to cover the entire city. It was deemed desirable to commence work on the area embracing the downtown business section, which would require about 800 plans. It was thought that these could be completed in about five years. The division of cost, after some consideration, was established on an even share basis for each of the four parties concerned. It was decided that the work involved by the preparation of the plan should be carried out by the Department of Works. It was thought at the beginning that the existing plans of public works could be used as a basis for the composite plan, but it was found that many of these plans could not be coordinated in a manner suitable for the purpose and that they did not furnish all the information required. The survey work which preceded the commencement of the plans therefore became a much more extensive operation than was originally anticipated.

"It is of course impossible to establish by surface survey the location, depth and character of all subsurface structures. This most necessary information must therefore be secured from the various utility companies. To this end a preliminary plan of each area is plotted from the survey on paper to a scale of 20 feet to 1 inch. Cross-sections of the street are also plotted to a scale of 10 feet to 1 inch. All surface construction, sewers, water mains, and areas are shown and the plan forwarded in turn to the Bell Telephone Co., the Toronto Hydro-Electric System, and the Consumers' Gas Co. in that order, so that the services of each company may be accurately plotted



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thereon. The Consumers' Gas Company then returns the plan to the Department of Works. All utilities are inked-in and developed in order to facilitate tracing. This is particularly useful, since lines not infrequently cross each other. When a number of such plans have been prepared, they are checked in unison by representatives of the utilities and the city.

"The preliminary plans, being made on paper and passing, as they do, through so many hands, are not suitable for a permanent record. A tracing on cloth, therefore, is made of each plan. For purposes of filing, these tracings are made to a size of 20 x 30 inches with sufficient margin to allow for binding and posting of revisions to the plan. The tracings when completed are checked with the preliminary plan by the supervisor and are then ready for signature. Four prints of the tracing are made on Ozalid paper, one for each of the four parties concerned, viz., the city, the Bell Telephone Co. of Canada, the Toronto Hydro-Electric System, and the Consumers' Gas Co.

"The copy for the city is filed for reference and is the only one to be colored.

"The substructures, including manholes and chambers, are given distinguishing colors, as follows:

Bell Telephone conduits	blue
Toronto Hydro-Electric System conduits	yellow
Consumers' Gas mains	brown
Water mains	green
Sewers	red
Canadian National Railways Telegraph	orange
Canadian Pacific Railways Telegraph	violet

"The file or city copies of the plan are placed in large loose-leaf stiff-backed binders which keep the prints clean, flat and easily accessible. Each binder is furnished with a legend sheet and a concession key plan on which, as new prints are added, it is so indicated by a green wash.

"At the end of each calendar month, a report in chart form showing progress of plans is made by the supervisor for presentation to the monthly meeting of the Committee. This chart shows: preliminary plans started, sent out, returned; tracings started, finished; Ozalids made and colored.

"During the year applications and sketches are received by the Department of Works for the installation of subsurface lines at hundreds of locations throughout the city. These are all carefully examined and checked with the requirements of the ideal plan. When it is found that any proposal comes within the scope of a completed Committee plan, it is held until the construction is finished and the actual location in the ground can be determined. The tracing and Ozalid are then revised. It has been found that one-sixth of one draughtsman's time is employed in revising and keeping up to date the tracings and Ozalids. As more plans are completed, the time required for this activity will increase.

"Three draughtsmen are employed on the work, and the total time required to prepare and complete an average plan is approximately 48 hours, which is made up as follows:

Plotting preliminary plan	14 hours
Developing preliminary plan	3 "
Tracing and finishing	29 "
Coloring Ozalid	2 "
	48 hours

"The time required by the utilities in placing their work on the preliminary plan and checking it is not included in this time.

"The cost of preparing plans, while much higher at the start than was expected, owing to our treading unbeaten paths and having, as it were, to create a technique, has gradually been decreased, and, for some time past, work has been produced on a reasonably economical basis.

"In some instances it has been possible to use surveys which it had been recently necessary to make for other public work, thereby avoiding duplication and additional cost to the composite plans.

"Our early estimates of progress and cost were too optimistic, partly because we were exploring new avenues of effort with little information to aid us, and partly because of the extremely complex problems which were encountered.

"Our work to date, however, has embraced the downtown area where, undoubtedly, the worst conditions exist, and it may reasonably be expected that future plans will be produced more rapidly and at a less cost. It is a curious thing that surface work—for instance, the laying of a pavement—is never proceeded with until plans, specifications, and estimates have been carefully prepared, while, on the contrary, underground work, which is more complicated and more difficult to place, has been treated in the most casual manner.

"As the work develops, I feel that it will be found unnecessary for many years to prepare plans of streets in a number of the present large residential areas, and that the Committee would be well advised to continue development along principal streets.

"The members of the Public Utility Coordinating Committee are convinced of the great importance of the work which has been embarked upon, and feel strongly that the expenditure which has already been made, and any that may be made in the future, will be relatively little as compared with the saving effected by having such a plan available as a guide in the design of future subsurface structures."

ACKNOWLEDGMENT.—From a Report of the Committee on Subsurface Structures, City Officials' Division, American Road Builders' Association, presented at the 35th Annual Convention.

MOVEMENT FOR RE-ZONING AND RE-PLANNING

OVER one-third of the cities of the country (37%) now have an active movement on for re-study of their city plan, for revising their plan in some way, or for re-zoning; and more than two-thirds (67%) of the cities of over 500,000 population have such a movement, according to a large sampling made by the National Association of Real Estate Boards in connection with its recent semi-annual survey of the real estate market.

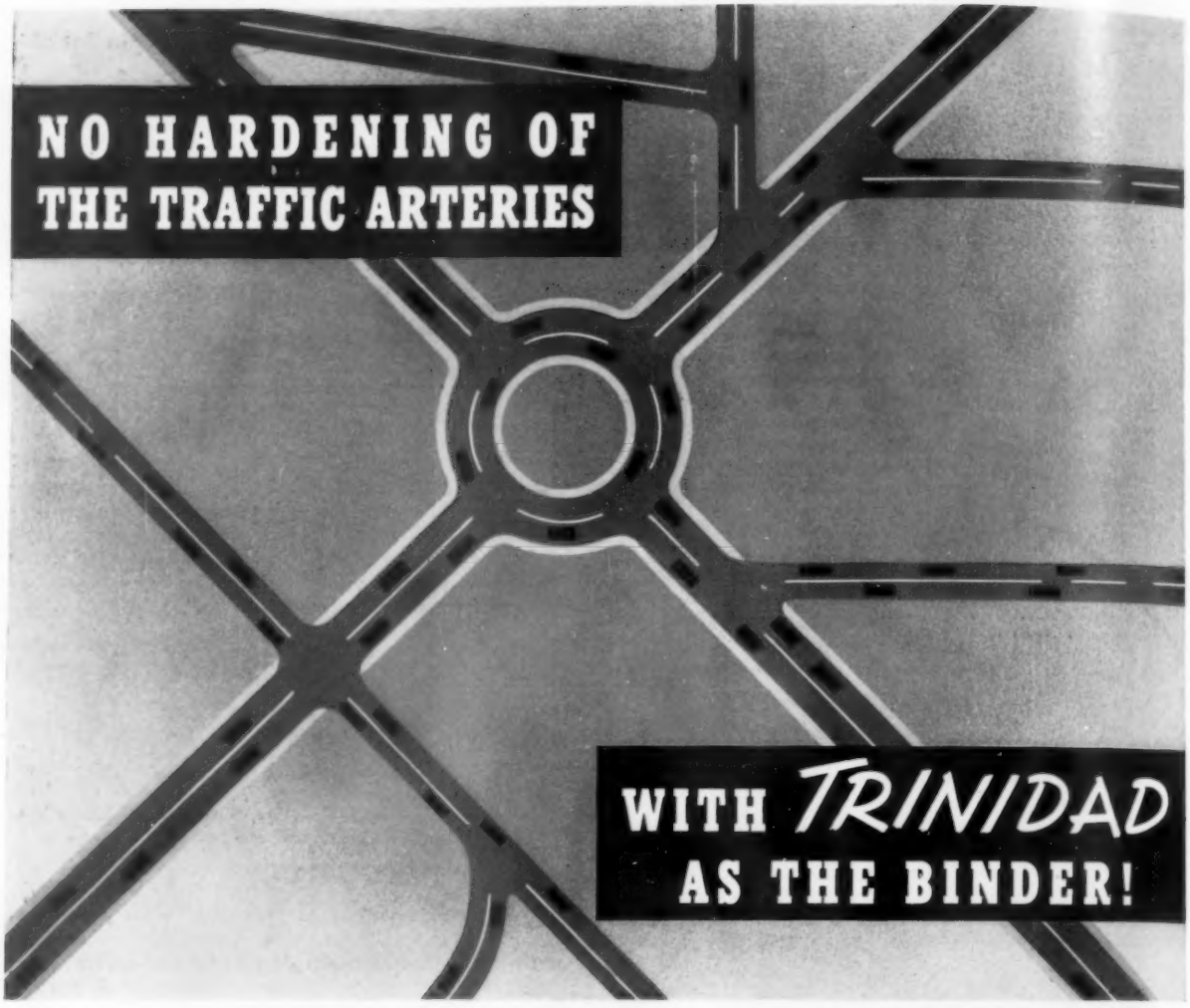
Taking cities of over 200,000 population, over half are today studying the need for new or revised zoning and planning action. Narrowing the inquiry to cities having a zoning ordinance now in force, 31% of such cities surveyed have an active movement for re-planning or re-zoning.

The reports covering 259 cities bring out the very striking degree to which re-study of city plans and of zoning needs is now going on, looking toward readjustment to changed needs and toward the checking of urban blight, and in preparation for expected new building.

The largest cities show the most general trend toward re-examination of their planning and zoning provisions. Geographical differences are marked. Regions having a high percentage of cities in which new action is under discussion are: the Southwest region, with 60% of its cities so reporting, the Southeast region, with 46%, the Great Lakes region, with 37%, and the Central Atlantic region, with 35% so reporting.

There were 1,761 cities having some kind of planning or zoning board or ordinance as of January, 1937, according to the last governmental survey, made by the National Resources Committee. Of these, 933 had official planning commissions, and 84 had unofficial planning commissions whose status was unreported. In addition, 128 cities had zoning boards and 515 had zoning ordinances but no planning or zoning organizations.

Of the 1,311 zoning ordnances in effect, 954 were comprehensive ordinances; 235 were for use only; 8 were for use and height; 96 were for use and area; 18 were interim ordinances; 11 were unspecified as to type. In addition, 89 were reported to be in preparation.



ONE of the major paving advantages of Trinidad Native Lake Asphalt is its inherent vitality. Nature has endowed this native lake asphalt with a ductility that persists even though it has been exposed to generations of a year-round summer sun and countless tropical tempests.

That's why Trinidad Native Lake Asphalt pavements so ably provide the resiliency to withstand the shocks of heavy traffic.

In addition, Trinidad Native Lake Asphalt contains a mineral filler colloidally dispersed in a manner not yet duplicated commercially in any other asphalt. This filler definitely tends to stabilize the pavement and prolong its life.

Highway engineers interested in low-cost-per-square-yard-per-year paving are invited to correspond with Barber and learn more about Trinidad Native Lake Asphalt. Clip and mail the coupon below, pinned to your letterhead, checking the Barber Asphalt Paving Products in which you are most interested.

TRINIDAD NATIVE LAKE ASPHALT

▼ Approximately 50,000 sq. yards of Trinidad Sheet Asphalt laid in 1935 on North Second Street, Harrisburg, Pa.

BARBER ASPHALT CORPORATION, Dept. AC-9, 1600 Arch Street, Philadelphia, Pa.
Please send me complete information about the Barber Products checked below.

- ☐ TRINIDAD LAKE ASPHALT — For hot mix, for cold-lay sheet asphalt and asphaltic concrete pavements.
- ☐ BARBER EMULSIFIED ASPHALTS — Used cold for penetration, pre-mix, road mix (mixed in place) and surface treatment work.
- ☐ GENASCO CRACK FILLER — For maintenance of concrete roads.
- ☐ BARBER BRAND LIQUID ASPHALTS — For cold surface treatment—for hot surface treatment.
- ☐ BARBER BRAND WINTER COLD PATCH — A cut-back asphalt for use in patching and maintenance work in cold weather.
- ☐ GENASCO BLOCK AND JOINT FILLER — For brick, granite block and concrete highways.

Forward Steps

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

A Municipal River Beach with a Seaside Personality

FORT WAYNE, IND.—This inland city enjoyed no free bathing facilities until Mayor Harry W. Baals two years ago suggested that some city property along the St. Joseph River be utilized for swimming. The City Light and Water Utilities had the project all completed in 1936, and the next year many improvements appeared in the form of park benches, loudspeakers, slides, swings, diving boards, and ample parking space. A sea-wall was also constructed of the old stone from a former post-office building; diving and swimming events were sponsored, and swimming instructions provided without charge by full-time lifeguards. The beach is located upstream from the city's sewage discharge, and no sewage enters the stream above the beach site.

The municipal beach idea became so popular that Mayor Baals and the utilities crews started a program of still broader recreational facilities at the beach. This year two free bath-houses were erected; a patrol system prevents vandalism and disorder; a public-address system facilitates handling crowds and sports events. Lighting of the pool and beach for night bathing attracts thousands. New equipment includes a softball diamond floodlighted for night playing, basket-ball and volley-ball courts, an outdoor ring for boxing and gymnastic events, and a huge sand-box, shown here. A checkerboard 12 feet square with checkers nearly a foot in diameter affords keen enjoyment to as many as ten rows of spectators as well as to the players.

Prior to the establishment of the city beach, one or more drownings happened each year. In fact, the drowning of two youngsters in 1935 caused Mayor Baals to proceed with his plan of giving to citizens a supervised bathing beach right in their own city. In the three years of municipal operation not a death from summer bathing has occurred within the city.

CLETUS JUNK.

THE SAND-BOX AT FORT WAYNE'S RIVER BEACH

The Business of Keeping Well People Well

CHATTANOOGA, TENN.—When the Director of the Chattanooga Chamber of Commerce originated and initiated the plan for a Health Council, there was started an evidently unique organization for keeping well people well that is attracting favorable attention in other parts of the country and winning the approbation of observing state and national public health officials. Motivated by the fact that the loss of health means not only a tremendous economic loss, but the loss of happiness, the Chattanooga Health Council was inaugurated in October, 1937. Sponsored by the Chamber of Commerce, financed by the Chattanooga Community Chest, indorsed by the city and county health departments and by public health authorities, the Council has embarked upon this serious educational program to promote public and individual health with the approval and active participation of the medical profession.

Its program is centered on the obviously fit, an estimated 90 per cent of the population, and is sounding a warning to the physically confident in its endeavor to combat through education and other available preventive measures the annual loss due to illness to every family, to each business concern, and to industry generally.

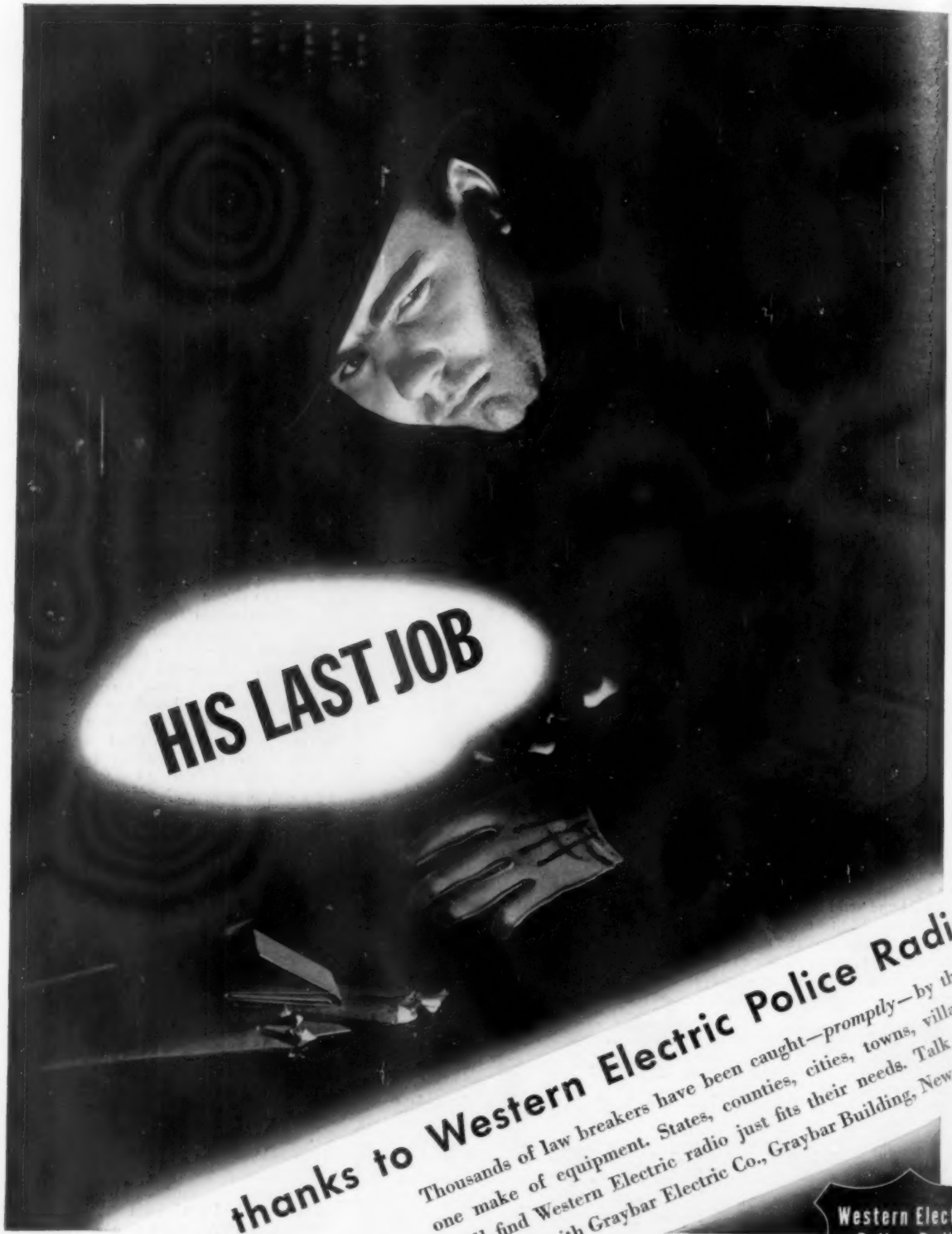
The forty members of the Council, chosen for their leadership, represent the major organizations of the city, including the medical and dental societies, city and county health departments, business and civic groups, totaling memberships of well over 10,000. Sitting in on its conferences are physicians, dentists, lawyers, insurance officials, industrialists, chemists, engineers, educators, ministers, merchants and club women.

Realizing that too often information is brought to the public through unauthoritative sources, this health-promoting body is placing before the many organizations and industries of the city able physicians who have generously responded to the invitation to speak on the Council's program and who are in every address stressing an annual physical examination and a twice yearly dental examination. The result has been that in less than a year's time hundreds have heard authoritative health messages covering a wide range of pertinent subjects by members of the medical profession. The audiences have consisted of many types, including club and society women, business, professional and trades people, office and factory workers, and sales and service employees. Busy mill workers have stood among their spindles to listen eagerly, department store employees have come to work at an earlier hour for a morning health talk, business men at their luncheon clubs have given thoughtful attention to health warnings, and mothers have taken interested part in the Council's health forums.

A further powerful medium for the health propaganda has been the contributive interest of the press, the three newspapers of the city carrying the health addresses of the doctors to their thousands of readers. Editorials have emphasized and encouraged the Council's work, and one newspaper published a special medical edition. The publicity has totaled in 11 months 4,189 inches, or approximately 199 columns.

Inaugurated simultaneously and linked with the Health Council is the Smoke Abatement Department that is sponsored by the Chamber of Commerce and financed by the city of Chattanooga. Newspaper articles, radio programs, talks, house-to-house campaigns, chimney watching, firing instructions and smoke readings, all are making the city mindful of the detrimental health and economic effects of smoke, and contributing to the task of the Smoke Abatement Engineer, who is recording definite industrial, business and domestic abatements.

The Council may further count to its



. . . thanks to Western Electric Police Radio

Thousands of law breakers have been caught—*promptly*—by this one make of equipment. States, counties, cities, towns, villages—all find Western Electric radio just fits their needs. Talk over *your* needs with Graybar Electric Co., Graybar Building, New York.

Western Electric Police Radio is giving added protection to 45,000,000 people.

Western Electric

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POLICE RADIO TELEPHONE EQUIPMENT

Mention THE AMERICAN CITY—it helps.

credit a positive increase in physical and dental examinations, the cooperating with the Tennessee Department of Public Health in an Industrial Hygiene Survey conducted in the city among 200 plants, a contributive interest in improved health departments of both city and county, submitting fact-finding schedules totaling 700 questions in the Inter-Chamber City and Rural Health Conservation Contest, sponsoring a spring clean-up campaign when 23,000 circulars were distributed through the schools, and the giving of trophies to white and colored schools.

While the idea of the Health Council was received with much interest, it was not of mushroom growth, but took firm root only after a long period of determined and persistent effort toward educating the public and concretely setting forth in folders and otherwise the advantages of the proposed Council. The Community Chest was interested in the worthwhileness of a program centered on the general welfare of the community, with the result that it annexed the Council as one of its agencies.

The Chattanooga Health Council owes its existence and an opportunity for successful functioning to early enthusiastic support, to the fact that its establishment, the directing and carrying-out of its objectives, was delegated to competent and energetic leadership; and that it has the hearty cooperation and participation of the medical and dental profession and of the press.

MRS. LAPSLEY HOPE,
Director, Chattanooga Health Council.

Unique Low-Rent Housing Plan for Fort Wayne

FORT WAYNE, IND.—A unique construction plan to eliminate bad housing conditions will be placed in operation within the next few weeks by the Fort Wayne Housing Authority. The program, which calls for a 50-unit rehousing project, will be effected with the use of WPA labor. The houses will be prefabricated according to factory plans by the workers, and other WPA men will be directed by the Authority to erect the homes at the proper places.

The houses, consisting of one-story structures comprising a combination living room, dining room and kitchen with bath and two bedrooms, will cost (for materials) about $900 each and will rent at $2.50 per week. One family will be housed in each structure.

In every case where it is possible, attempts will be made to erect the home on the same spot where the family now resides. The program is based on the fact that slums often exist on land held for future use as industrial or commercial locations. Often the rents from such slums do not pay the taxes. The Fort Wayne Authority, which under Indiana state law has all the powers of a non-profit real estate corporation, offers to purchase such properties for $1 each. It also agrees to resell the property for $1 to the original owner at any time he finds a better use for it.

In this way the Authority, whose real estate is tax-free, gets property for housing at no cost, and the landowner is relieved of the tax burden until his land can be put to a more profitable use.

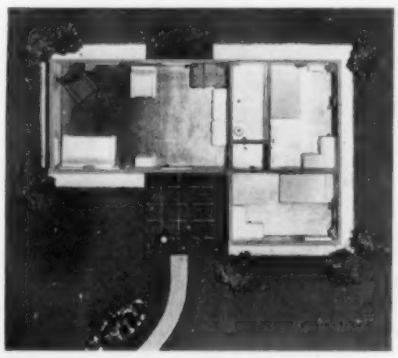
Next, the Authority clears the land of old property with WPA labor and erects on it an entirely new type of prefabricated house. This house is built in sections by factory production methods and can be assembled in 24 hours. These sections will be manufactured out of 2 x 4 timbers and phenol-resin plywood panels insulated with 4 inches of rock wool.

The houses will stand on concrete floors 4 inches thick and on a gravel course 8 inches thick. Research has shown that the concrete floors will be easily kept clean and that, contrary to popular notion, they are not cold in winter when protected by a base of gravel such as the plan calls for.

Each house is to be 32 x 20 feet in size. The combination living room, kitchen and dining room is to be 12 x 20 feet in size, and the bedrooms 8 x 12 feet. Sliding casement windows are provided and are to be covered with 16-mesh bronze screens with wooden louvres. Thirty-six wall panels will be used in building each house. Bolts placed when the concrete floor is laid will hold the structure of the foundation, and, in addition, long bolts running the entire length of the sides will further add to the stability of the structure. Wiring in each of the dwellings will be installed under supervision of the City Electrical Inspector after the house is assembled, and will be placed in exposed metal conduits of a type approved by underwriters.

The system of construction is largely a development of the housing research project at Purdue University. The United States Bureau of Standards, the Forest Products Laboratory of the University of Wisconsin, and the Technical Division of the Federal Housing Administration, have made recommendations that have been followed in the plans and specifications.

D. DELBERT BRUDI.



Photos by Sheldon Hine

PLOT PLAN AND EXTERIOR VIEW OF THE FORT WAYNE PREFABRICATED HOUSE

If You Produce Good Government—Sell It

AMERICAN city government breaks down oftenest today at its point of contact with the public. . . .

In large measure the task of reconciling governmental knowledge with public opinion has been left to politics. The voice of the able administrator is not often heard in the land. . . .

An examination of the machinery of local government will show that any clear-cut program of municipal public relations must fall into three divisions: (1) personnel relations, (2) press relations, (3) public reporting.

Most cities' programs fail because public policy is shaped from an outward (publicity) rather than an inward (public relations) starting point. . . .

The policy set down for each division of a program should prevail throughout. If the employee is taught courtesy and sincerity in all public dealing and the necessity for clarity and simplicity in interpreting the work of his department, the same policy should be the theme in the city's more general press relations and public reporting.

. . . . It is a rare municipality in which the entire program is coordinated and balanced so that a complete picture of the city's services in relation to its cost is continually before the public. . . . No matter how competent or how complete the municipal services become, the job will remain unfinished until the extent of these services is conveyed to the public. The thing works both ways. If the individual citizen is proud of his city government, the municipal employee can take pride in his job. If the latter has pride in his work, he will have the right attitude in his public contacts. When such a public attitude is created and personnel morale is heightened as a result, any city will have a long lead on the solution of its grievous public relations problem.

HAL HAZELRIGG,
Public Administration Clearing House,
Chicago, Ill.

—From *The Public Opinion Quarterly*, July, 1938.

LOCK JOINT PIPE SCORES AGAIN!

20 Major Pipelines in the New England States Alone

~~19~~
~~18~~
~~17~~

IN JULY, 1938, the Metropolitan District Water Bureau of Hartford, Conn., awarded the Lock Joint Pipe Company a contract for supplying and installing one mile of 42″ diameter pipe. This is the fourth major pipeline of Lock Joint Concrete Pressure Pipe for the City of Hartford and the twentieth in the New England States including installations in such important cities as Portland, Boston, New Bedford and Providence.

Careful workmanship together with tested and approved materials ensure a long, trouble-free life to Lock Joint Concrete Pressure Pipe.

To those attending the New England Waterworks Convention, a cordial invitation is extended to inspect our manufacturing plant at the junction of New Park Ave., and Flatbush Avenue, in Hartford, where this 42″ pipe in being made.

LOCK JOINT PIPE CO., *Est.* 1905 **Ampere, New Jersey**

Pressure : Subaqueous : Sewer : Culvert

LOCK JOINT *Rein-forced* **CONCRETE PRESSURE PIPE**

Model Off-Street Parking Provided

By ALLEN H. ROGERS
Superintendent of Public Works, Incorporated Village of Garden City, N. Y.

WHEN, about seven years ago, the prosperous village of Garden City discovered that over half of the parking areas at the four local stations on the Hempstead Division of the Long Island Railroad were being used by cars from nearby communities, an amendment to the Village Law was secured to permit a municipality to acquire space for parking and to license the use of that space. By this device, parking at depots was restricted to residents, who became parking-conscious.

Following this, the Village Board of Trustees gave practical consideration to handling parking, present and future, in the business district, with the result that Section 1 developed and on June 23 was formally dedicated. Section 1 is the immediate part of an ultimate plan to provide municipally-owned parking facilities in all business districts as required.

Section 1, costing in all $197,000, consists of seven adjacent parking areas back of apartment houses and stores, some of which are branches of prominent New York department stores. Land cost, amounting to about 75 per cent, was assessed on a ten-year basis to the commercial houses benefiting, while the improvements, amounting to $46,000, were absorbed in general village expense. The cost to a taxpayer type of store over the ten-year period amounts to about $9 per month. No fee is charged nor license required for use of these parking fields.

The advantages of this project are threefold in that it attracts customers and by thus increasing business reduces tax delinquency, defines the business district of this vallage of 10,000, and keeps parked cars off the residential streets.

Restricted parking is permitted on the business streets, but the municipal fields are so eminently convenient that their use is instinctive. Where desirable, 5-foot walkways have been constructed from the fields to the street, to furnish accessibility to the stores on the opposite side of the street and thus avoid a tendency to drive from one field to another.

The system is entirely flexible, each field being designed to retain a natural appearance while efficiently serving the needs of the particular businesses benefited. Existing trees were kept where possible and 300 other trees and several thousand shrubs were planted. Where the field is immediately in the rear of stores, a combined sidewalk and ramp permits delivery trucks to back up to the rear door. In the vicinity of apartment houses, all-night parking is permitted. An ample number of signs are provided, obviating the necessity for attendants. The fields are lighted by 100-cp luminaires on ornamental Union Metal Manufacturing Co. posts, from underground circuits.

With the exception of entrance and exit drives, only rear property has been utilized, so that the total cost of acquisition of 8½ acres in the business district was only $143,166, including cost of litigation, engineering and incidental expense. The acquisition proceedings divulged that property was worth about 30 per cent more than the assessment, which is supposed to be 100 per cent of value, with consequent benefit to the municipality. All parking in Garden City must now be on municipal property.

All construction work was performed by the forces and equipment of the Department of Public Works, and included demolition of one residence and several garages, excavation of 6,800 cubic yards of topsoil and excess fill, 12,017 linear feet of reinforced-concrete curb and 19,435 square feet of concrete or macadam sidewalk, and surfacing 28,774 square yards with 5 inches or more of compacted cinders treated with a primary application of tar and sand and a surface application of either emulsified or cutback asphalt and dolomite screenings. The approach driveways will be retreaded with a 1½-inch plant mix bituminous macadam. Typical equipment, used to complete the last field in the first week of June, included a Galion 10-ton roller and an E-Z-Lift Grader, a concrete mixer and a McCormick-Deering tractor. Our full arsenal of equipment comprises 26 cars and trucks and 42 pieces of plant such as tractors, rollers, mowers, concrete mixers, etc.

The planning and actual provision of this municipal parking service has had the keen interest of the entire Board of Trustees. Special initiation has been given by Mayor Franklin S. Koons and Trustee Charles G. Reinhart, Jr., Commissioner of Public Works and Chairman of the Committee on Parking.

Recent City Manager Appointments

C. L. STINE, former City Manager of Pampa, Texas, was appointed City Manager of Lufkin, Texas, effective August 1. He succeeds T. L. Dunn.

Carl Budwesky, City Attorney and Acting City Manager since the death of E. C. Dunn last February, has been appointed City Manager of Alexandria, Va.

A. J. Koenig, City Manager of Plymouth, Mich., from 1928 to 1931, and City Manager of Fort Atkinson, Wis., from 1931 to date, was appointed City Manager of Wilmette, Ill., effective September 1.

M. H. Kelly, City Clerk, has been appointed City Manager of Eastland, Texas.

Merrill D. Knight has been appointed City Manager of Norton, Va., to replace Roy P. Bishop.

Charles P. Ismon, Tax Assessor, has been appointed City Manager of Jackson, Mich., to fill the vacancy created by the death of I. R. Ellison.

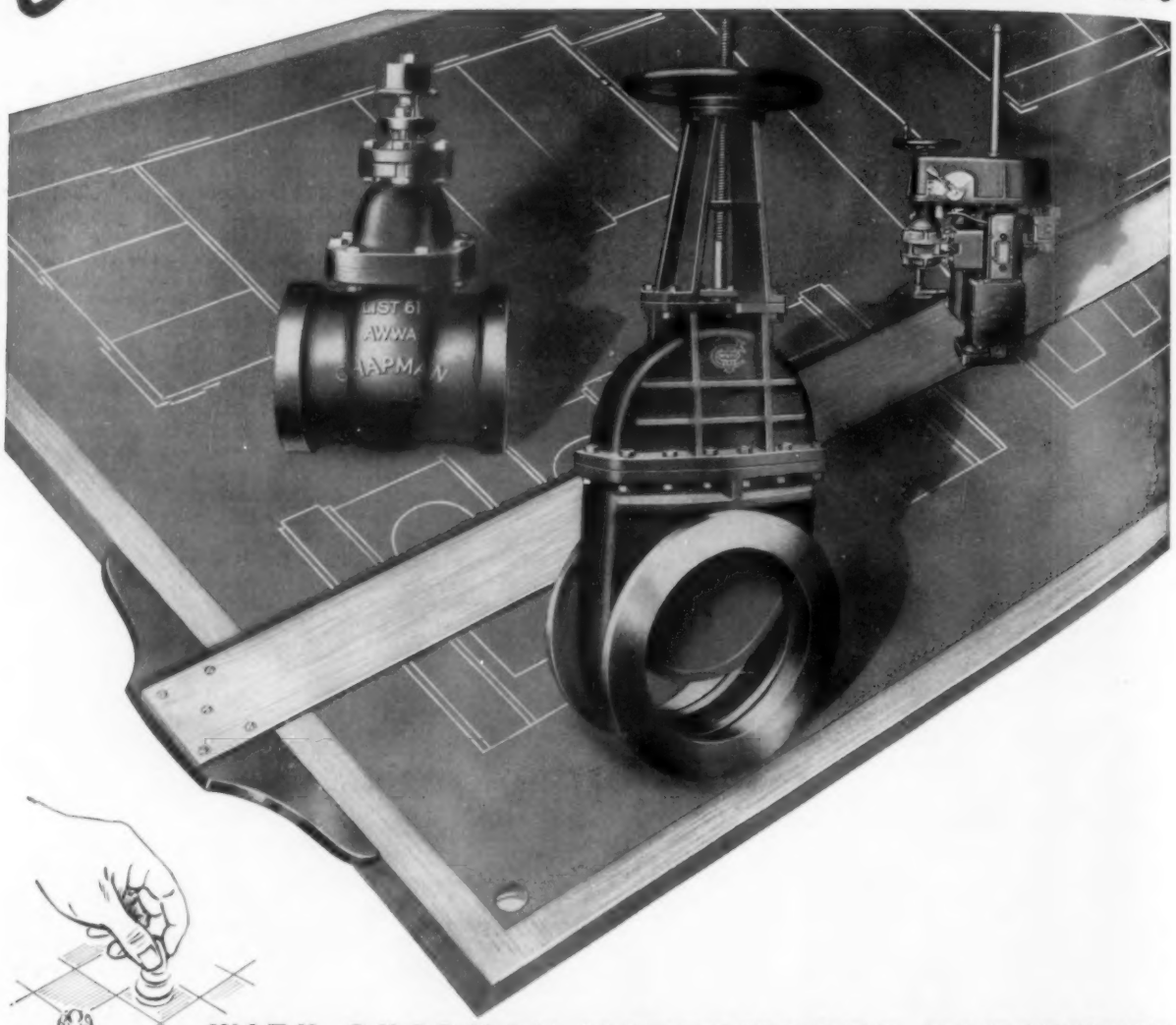
CLARENCE E. RIDLEY,
Executive Director, International City Managers' Association.

The Municipal Bond Market

Recent sales of new issues from the August numbers of *The Bond Buyer:*

Amount	Borrower and Purpose	Rate (%)	Term (Years)	Basis (%)
$135,000	Fitchburg, Mass., Funding	1	1-5 Ser.	.83
200,000	Binghamton, N. Y., Public Improvement, Work Relief	1.20	1-10 Ser.	1.13
258,000	Rockford Tp., Ill., Funding	1.75	6 Avg.	1.69
1,100,000	Providence, R. I., Municipal Dock	1.75	1-20 Ser.	1.74
300,300	Albert Lea, Minn., School District	2.10	13.33 Avg.	2.07
100,000	Washington, Ind., Electric Utility Revenue	2.25	3.25 Avg.	2.14
100,000	Fall River, Mass., Water Supply Improvement	2.75	14.25 Avg.	2.72
450,000	Virginia, Miss., Community Building	3	?-10.75 O.A.	3
295,000	Des Moines, Ia., Airport	3.25	3-11.66 O.A.	3.24
146,000	Jersey City, N. J., Land Purchase	3.5	5.33 Avg.	3.5
185,900	Long Branch, N. J., Jetty Improvement and Assessment	4	7 Avg.	3.94

Checkmate DEPRECIATION AND MAINTENANCE COSTS



WITH CHAPMAN WATERWORKS EQUIPMENT

Make a decisive move against any opening attempted by wear and maintenance. Move Chapman Equipment into all key positions throughout your works and system . . . and the game will go *your way* from then on.

All Chapman equipment starts with the long-range viewpoint . . . with forward-looking design that defies obsolescence, prolongs usefulness. Then it is made metallurgically and mechanically fit to live up to—*and through*—the toughest working conditions.

You can get the benefit of Chapman's extra life-span in a complete line of equipment for every department of operation. Globe, gate, and check valves, in all sizes. Automatic cone valves. Sluice and shear gates. Hydrants, brass goods. Foot, flap and mud valves. Floor-stands and all types of operating mechanisms. Get one quality, from one source, under one responsibility. Write for complete information.

CHAPMAN VALVE
MANUFACTURING COMPANY
Indian Orchard, Massachusetts, U. S. A.

During September we hope you will remember to mention THE AMERICAN CITY.

Traffic Control and Facilitation

Conducted by Publications Committee, Institute of Traffic Engineers, 1 Park Ave., New York

Paul L. Green, Chairman; George W. Barton, Kenneth W. Mackall, Miller McClintock, Robert A. Mitchell, William R. McConochie, Arnold H. Vey, Joseph L. Wehmeyer, William A. Van Duzer, Thomas J. Seburn, Roger L. Morrison, Otto K. Jelinek, William C. Brandes

Three Lanes West and One Lane East

LOS ANGELES' greatest traffic-congestion problem is to move westbound traffic during the evening peak period between 4:30 P.M. and 6 P.M. Our westbound flow reaches a 15-minute peak of more than 4,800 cars. The eastbound flow during this period is about 1,600 cars, or a ratio of three to one.

The plan which has been in effect for more than one year calls for the setting-up of pedestal standards along the left side of the first lane to the left of the center line, thus providing three lanes westbound to one lane eastbound. Actual tests disclose that over-all speeds have been increased as much as ten miles an hour.

It has been found that this third lane, farthest away from the frictional influence of the curbs and drawing to it the fastest-moving types of drivers, carries more traffic than the regular lanes. Of the westbound traffic, the lane nearest the curb carries 24 per cent of the flow, the second lane 36 per cent and the offset lane 40 per cent.

The third lane has a traffic flow that reaches a peak of approximately 1,000 cars per hour, obtained despite heavy movements of cross traffic at many signalized intersections.

The new plan has captured the Los Angeles motorists, and has been enlarged to include Eighth, Twelfth, Flower, and Los Angeles Streets and Sunset Boulevard.

R. T. DORSEY,
Traffic Engineer, Los Angeles, Calif.

LOOKING EASTERLY ON WILSHIRE BOULEVARD AT WESTERN AVENUE, LOS ANGELES
Four traffic lanes are moving westbound, the lane to the right being beyond the center line. This leaves two lanes for the light eastbound traffic. Removable pedestal signs spaced at intervals guide the motorists. It is calculated that this intersection has a yearly traffic flow in excess of 34,000,000 vehicles

Improving the Job of Traffic Police

A STUDY of 167 cities of more than 25,000 population, which showed the size of their traffic forces in the 1937 National Traffic Safety Contest reports, revealed a normal traffic force of the equivalent of 3½ to 4½ full-time men per 10,000 population. In the smaller cities the number ranged from 2 to 3½ men.

In comparing a traffic force with this normal, the local conditions should be taken into account. Cities with many suburbs and a great deal of through traffic may require more than the normal traffic force. Normal attention to traffic averages 25 per cent of the total police time.

It should be remembered that the number of men is not an index of the effectiveness of the traffic police activity. In the absence of well-directed selective enforcement, guided by good accident records and good records of arrests and convictions, a large traffic force may accomplish inadequate results; while, properly directed to make the best use of man-power, a smaller force may do an effective job.

Signals and Motorcycles

Stop and Go signals have been developed to the point where they release the officer for less mechanical and more supervisory duties. Of course, where the need for traffic control is only intermittent and confined to portions of certain days, signals are not justified. It is there and then that officers are needed.

Again, there are places where officers are needed in addition to Stop and Go signals, to give general supervision to the traffic movement and to see that the signals are properly obeyed. However, at such times and places the officers do not perform the same duties that they would if the signals were not there, because their job is to supervise rather than direct.

The release of officers from such point duty makes them available for supervising traffic in larger areas. If they can be placed on motorcycles or in cars, the scope of their activity is further increased. In many cases violators can be detected or apprehended only by motorized officers.

Supervision and checking of parking time limits is a police job which uses much man-power for slight results in accidents prevented. In many cities the amount of time which can be devoted to such parking supervision and checking is so limited that only infrequent checks can be made, with no serious attempt to check at regular intervals corresponding to the parking time limits. As a result, drivers often disregard such regulations, and cars are frequently found parked for an entire day in a one-hour or ninety-minute zone.

Parking supervision can be expedited by using a three-wheel motorcycle and a stick with chalk on the end for marking tires of parked cars. It is claimed that one officer thus mounted can do the work of eight or more on foot—another example of the benefits of motorization of the traffic force.

Metered parking has, in many cases, greatly increased the rate of turnover in the use of parking spaces. It has done this because metered parking is easier to supervise than unmetered parking, since the fact of violation can be readily seen from a motorcycle. In addition, it is to a large extent self-enforcing because the violation is plainly shown to anyone who may pass the meter.

—From "Enforcement for Traffic Safety," a new National Safety Council publication. See p. 117.

"No Fix" in Minneapolis

THE "no fix" traffic tag system in which the city of Minneapolis began pioneering ten years ago places control of traffic tags in the office of the city comptroller, says Public Administration Clearing House. Books of serially numbered tags are distributed to the police by the comptroller's office, which keeps a record to show the disposition and number of each tag. At the end of the year police officers return all unused tags to the comptroller.

Be PENNY *wise—get* PERMANENCE

Here's the sure, safe, sensible way to get LONG life and LOW maintenance cost in your *small* mains. Spend a few *pennies* more per foot and lay *permanent, corrosion-resisting* water mains with

McWANE 2" CAST IRON PIPE

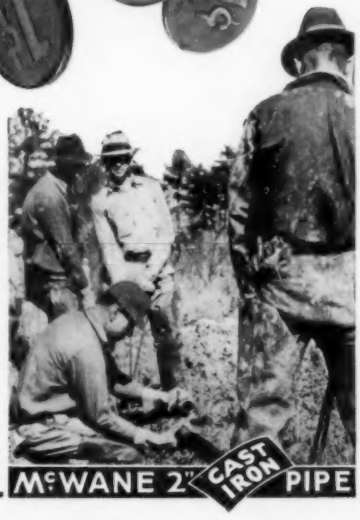
Then you're through—for a 100 years—with water leaks and losses—the expense of cutting expensive pavements—and still more costly replacements.

Over 27,000,000 feet of McWane 2" serves users from coast to coast. Easy to buy—adds less than 5% to the cost of the complete installation. Easy to lay—with unskilled labor as fast as the best machine can dig the trench. Investigate!

Sand Cast Inside and Outside

McWANE CAST IRON PIPE COMPANY

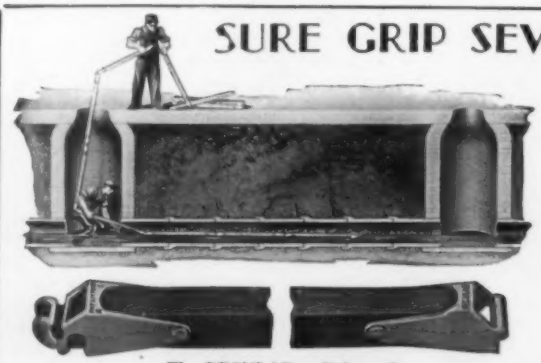
BIRMINGHAM, ALA. SIZES 1¼" THROUGH 12"



Easy to LAY

Simple, self-tightening Precalked Joints make McWane 2" easy to lay. No lead melting or pouring on the job. Just socket the spigot and caulk! for the joint materials are already in the bell. Precalked Fittings!

SURE GRIP SEWER RODS and ACCESSORIES



The REGULAR, a light rod,
Fir stock 1¼ x 1¼ inch square.

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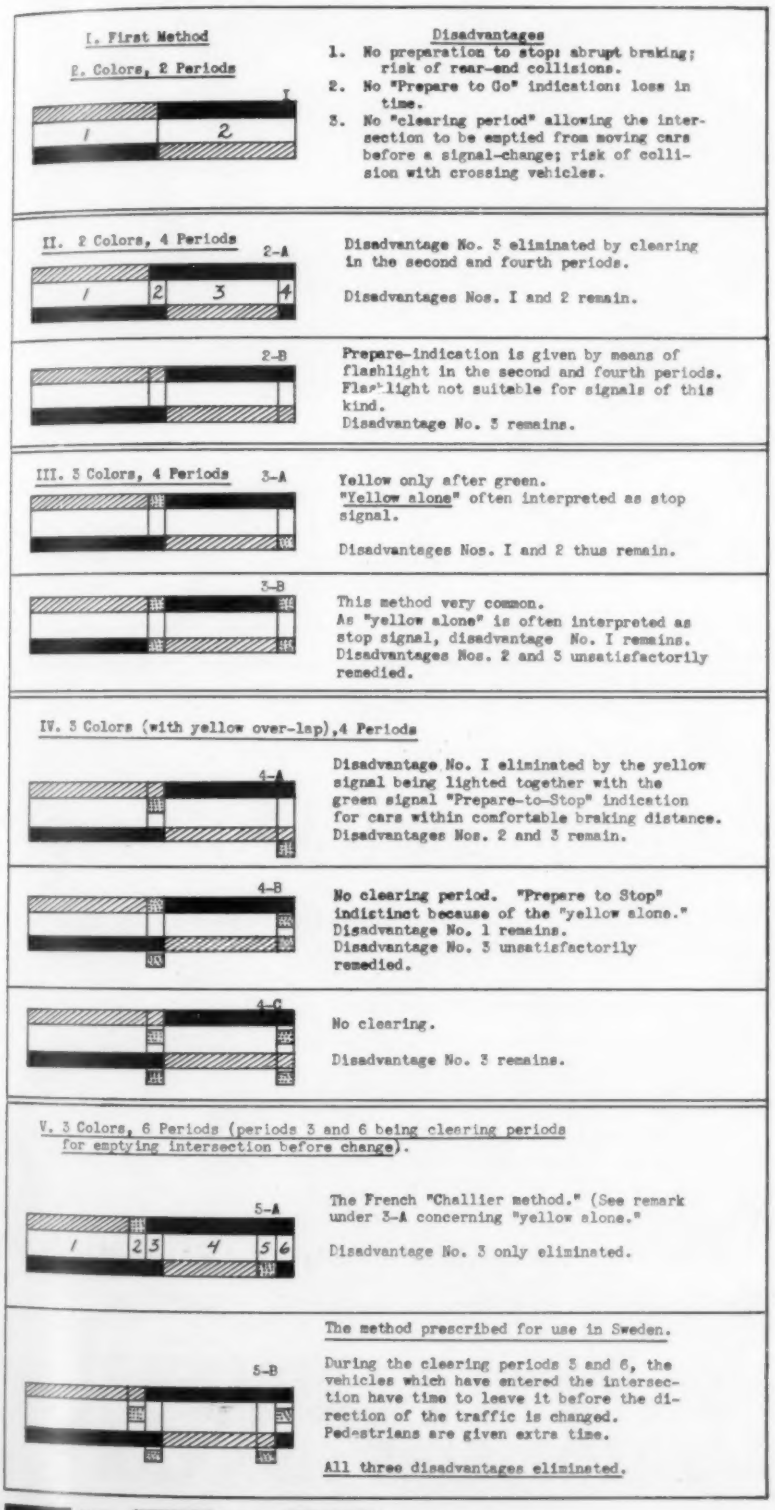
Sweden Standardizes on a Color Sequence

FOR the last eleven years, Stockholm and, indeed, Sweden have been endeavoring to find a color sequence for their traffic signals that will furnish (1) preparation to stop, and so minimize danger of rear-end collisions; (2) preparation to go, and thus save time; (3) a clearing period. The evolution is described by H. Carlén, of Svenska Aktiebolaget Gasaccumulator, associated with Signal Service Corporation, Elizabeth, N. J.


I. First Method
2. Colors, 2 Periods
1
2
Disadvantages
1. No preparation to stop: abrupt braking; risk of rear-end collisions.
2. No "Prepare to Go" indication: loss in time.
3. No "clearing period" allowing the intersection to be emptied from moving cars before a signal-change; risk of collision with crossing vehicles.
II. 2 Colors, 4 Periods
2-A
1
2
3
4
Disadvantage No. 3 eliminated by clearing in the second and fourth periods.
Disadvantages Nos. I and 2 remain.
2-B
Prepare-indication is given by means of flashlight in the second and fourth periods. Flashlight not suitable for signals of this kind.
Disadvantage No. 3 remains.
III. 3 Colors, 4 Periods
3-A
Yellow only after green.
"Yellow alone" often interpreted as stop signal.
Disadvantages Nos. I and 2 thus remain.
3-B
This method very common.
As "yellow alone" is often interpreted as stop signal, disadvantage No. I remains.
Disadvantages Nos. 2 and 3 unsatisfactorily remedied.
IV. 3 Colors (with yellow over-lap),4 Periods
4-A
Disadvantage No. I eliminated by the yellow signal being lighted together with the green signal "Prepare-to-Stop" indication for cars within comfortable braking distance.
Disadvantages Nos. 2 and 3 remain.
4-B
No clearing period. "Prepare to Stop" indistinct because of the "yellow alone."
Disadvantage No. 1 remains.
Disadvantage No. 3 unsatisfactorily remedied.
4-C
No clearing.
Disadvantage No. 3 remains.
V. 3 Colors, 6 Periods (periods 3 and 6 being clearing periods for emptying intersection before change).
5-A
1
2
3
4
5
6
The French "Challier method." (See remark under 3-A concerning "yellow alone."
Disadvantage No. 3 only eliminated.
The method prescribed for use in Sweden.
5-B
During the clearing periods 3 and 6, the vehicles which have entered the intersection have time to leave it before the direction of the traffic is changed.
Pedestrians are given extra time.
All three disadvantages eliminated.
RED
GREEN
YELLOW

Up to 1927, two-section traffic signals alternating green and red were used. These were unsatisfactory, despite the fact that 8,000 of them are operating without especial mishap in New York City, because they give no preparation for starting, stopping, and clearing the intersection before signal change. Consequently, during 1928-29 a yellow period was introduced after both the green and the red. The disadvantage was that the yellow alone was often interpreted as meaning "Stop." During 1930-32 a yellow overlap was used; but as before, there was no clearing period.

What appears to be the final solution, as it has been ordered that the Stockholm Method be used throughout Sweden, is:

Period	1	2	3	4	5	6
A—Street.....	G	G-Y	R	R	R	R-Y
B—Street.....	R	R	R-Y	G	G-Y	R

Facts on 1,000 Drunks

IN the District of Columbia 1,000 operators of motor vehicles were arrested for driving under the influence of liquor between August 1, 1935, and June 25, 1938.

Of the total of 1,000 arrests: 573 persons were involved in accidents; 976 were males and 24 were females.

Between the ages of 16 and 18 inclusive, there were only six arrests, which speaks highly for the law in the District of Columbia that prohibits boys and girls from operating any vehicle except one belonging to themselves, their parent or their guardian. This means that boys and girls between the ages of 16 and 18 in the District must secure the consent of the parent or guardian before they can operate.

Under the Financial Responsibility Law which is in operation in the District of Columbia, permits, registration cards and tags must be canceled for every person who is convicted of operating under the influence of liquor. Tags may be transferred to another owner, but the permit is usually held for six months or more, at which time it may be restored, provided the individual furnishes financial responsibility over a period of three years in the amount of $5,000 for death or injury to one person, $10,000 for death or injury to two persons, and $1,000 for property damage. Since this law went into effect, on August 1, 1935, the Department of Vehicles and Traffic of the District of Columbia has canceled 1,872 permits for convictions of driving while intoxicated.

M. O. Eldridge,
Assistant Director of Vehicles and Traffic, Washington, D. C.

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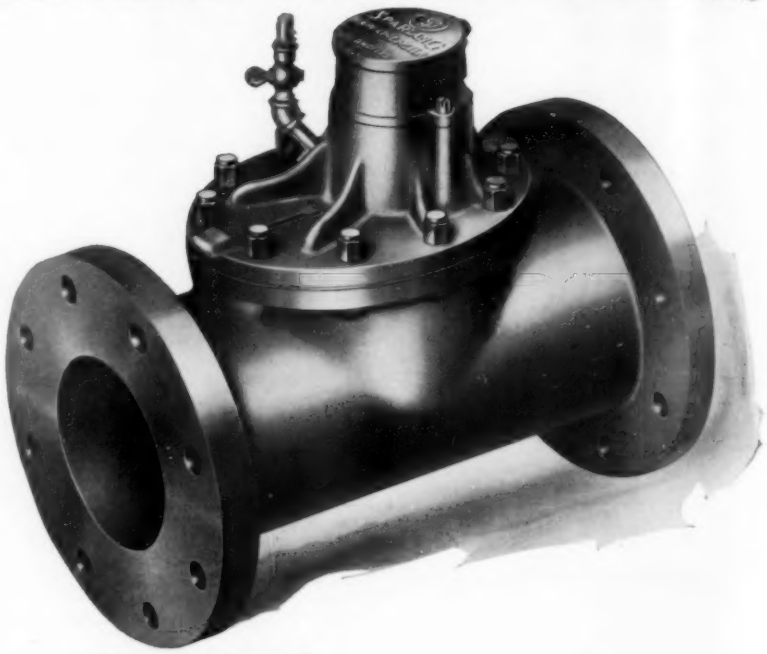

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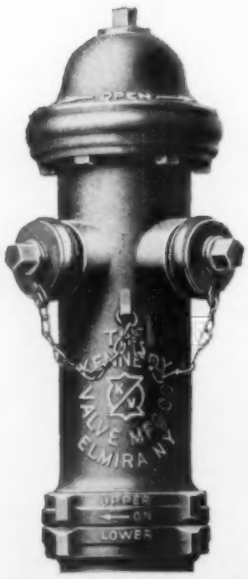

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Improving Municipal Administration

Current Items from the Public Administration Clearing House

Eight More Cities Install Civil Service Systems

RECOGNIZING a need for scientific personnel standards in their local governments, eight cities recently installed civil service systems, it was announced recently by Public Administration Service. The cities are Shorewood, Wauwatosa and Madison, Wis.; Fargo and Minot, N. Dak.; and Alameda, Roseville, and Coalinga, Calif.

Installation of improved personnel systems has been completed, with the technical advice of P.A.S., in all the cities except Wauwatosa. The civil service provisions are limited to Police and Fire Departments in Fargo, but in the other cities they extend to all branches of the city government.

Although different standards and procedures were established to meet local conditions, positions were classified and wage scales drawn in each city. All the systems also provide for service ratings, in-service training and competitive examinations.

The cities of Roseville and Coalinga will rely on the California State Personnel Board, and Shorewood on the Milwaukee County Personnel Board for technical assistance in administering the systems, since the small size of their cities prevents them from obtaining adequate technicians.

Cities Test Subdivision Controls to Check Tax Delinquency

ATTEMPTS to avoid further increases in tax-delinquent property by checking excessive land subdivision are being made in a number of cities and at least one state, the American Society of Planning Officials recently reported.

As the result of planning studies showing that a high percentage of tax-delinquent land consists of vacant lots in undeveloped subdivisions, the state of Washington has passed a law requiring cities, towns and counties to set up an agency to investigate all applications for new land plats or subdivisions. The law specifies that "it shall be the duty of such city, town or county to inquire into the public use and public interest proposed to be served by the establishment of such subdivision or plat. It shall also see that appropriate provision is made in any such plat or subdivision for streets, parks and playgrounds."

Other effective subdivision controls are employed by the city of Cincinnati, Ohio, and several New York and New Jersey cities. Cincinnati insists that such utilities as water lines and sewers be installed and streets surfaced by the developers before the city will accept the proposed subdivision.

Brookhaven, Long Island, is the first city in New York to require subdivision developers to post a $10,000 surety bond to guarantee grading and surfacing of roads.

A recent study by the New York Division of State Planning showed that in 5 cities and 47 towns in the state of New York the total property tax delinquency, exclusive of penalties, amounted to $34,500,000, more than two-thirds of which was charged against vacant lots. The greatest number of delinquent properties were recorded in the outlying areas. Similar findings are reported in a survey by the Michigan State Planning Board.

An earlier study of land subdivision in Michigan by Ernest M. Fisher and Raymond F. Smith reported an increasing lag in the utilization of subdivided land. In the city of Grand Rapids, Mich., for example, the accumulated investment in vacant lots was estimated at more than $26,000,000. At the highest rate of utilization ever recorded—that of 1925—it would take 16.7 years to absorb the vacant lots available in that city, the survey showed.

Private Sources Furnish Most of Local Funds for Low-Rent Housing Projects

SALE of bonds to private institutions will supplement loans by the United States Housing Authority for construction of low-rent housing projects in most cities, the Municipal Finance Officers' Association of the United States and Canada announces. Information received by the Association from 18 cities indicated that only a few expect to contribute large amounts of cash from city funds toward the projects.

A large number of the cities in which loan contracts with the U.S.H.A. have been approved have donated housing sites or portions of sites and agreed to construct streets, sewers, and other utilities. These contributions are deducted from the 10 per cent of the total cost which local authorities are required to furnish under the U.S.H.A. agreement.

Reports of city finance officers and heads of local housing authorities indicate a ready market for local housing authority bonds up to 10 per cent of the total cost. In the following cities these bonds have been sold, or definite commitments to purchase them when they are issued have been received from banks or bond houses: Allentown, Pa.; Augusta, Ga.; Baltimore, Md.; Birmingham, Ala.; Buffalo, N. Y.; Cleveland, Ohio; Detroit, Mich.; Knoxville, Tenn.; Pittsburgh, Pa.; and Youngstown, Ohio.

Officials of Austin, Texas, reported that the city had agreed to purchase the bonds in the event that they could not be sold at public sale, and that a local bank guaranteed the purchase if the city does not have sufficient funds. The New York City Housing Authority said the city agreed to purchase the bonds as the "initial step" in financing the housing projects. Officials of Syracuse, N. Y., said they hoped to sell the bonds to private investors, but if they failed to do so the city would consider means of financing the purchases.

It was indicated that the average interest rate on the local bonds will be 3½ per cent. In most cases banks and bond houses require bonds maturing in 15 years or longer, which are not callable until maturity.

Funded Debt and Personnel Data of Small Cities

OF 314 cities between 5,000 and 10,000 population reporting on indebtedness, 8 had no debt of any kind, and 18 others had no general funded debt, the International City Managers' Association has reported from advance material received for a forthcoming study of American small cities.

The 8 cities which have no debt are: Venice, Ill.; Red Oak, Iowa; Dayton, Ky.; Hastings, Mich.; Clinton and Webb City, Mo.; South Williamsport, Pa.; and Menominee, Wis. The 18 cities with no general funded debt are: Prescott, Ariz.; Durango and La Junta, Colo.; Cartersville, Ga.; Batavia, Naperville, and Wheaton, Ill.; Charlotte and Manistique, Mich.; Chillicothe, Mo.; Franklin, N. Y.; Kearney, Nebr.; Galion and Greenville, Ohio; Anardarko and Stillwater, Okla.; and Middletown and West York, Pa.

Fourteen of the 314 small cities reported having $1,000,000 or more general funded debt. Of these cities, the following are in Florida: Bartow, Bradenton, Clearwater, Ft. Myers, Lake Worth, Miami Beach, Palatka and Winter Haven. The other cities are Haddonfield, Ocean City, and Wildwood, N. J.; Bronxville and Larchmont, N. Y.; and Morristown, Tenn.

Of the cities that own and operate some utilities, 70 had no utility debt and 162 cities had a varying amount of such debt. Among the most common municipally owned utilities are electric light and distributing plants, gas plants, markets, sewage-disposal plants, and water works. In regard to unfunded debt, 130 cities have none and 108 have some debt of this kind.

To the question "Is special assessment debt a general obligation of cities?" 102 cities reported "Yes" and 102 cities reported "No," the others not answering.

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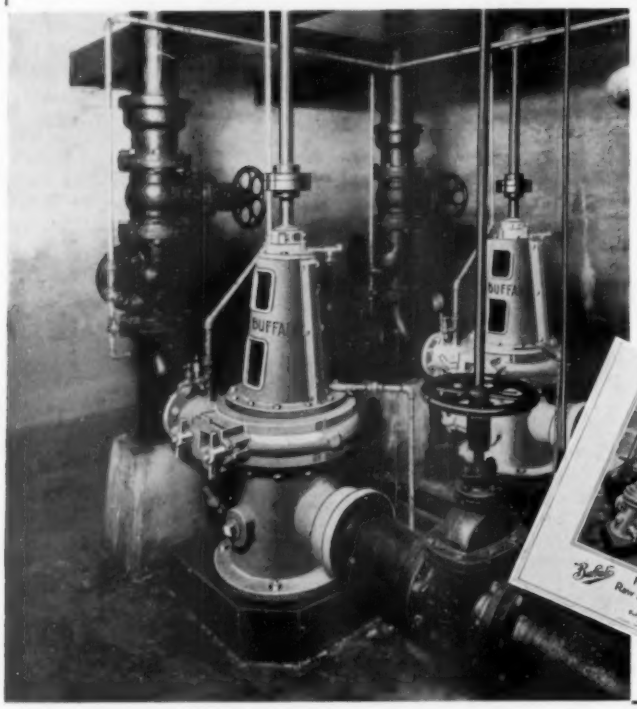

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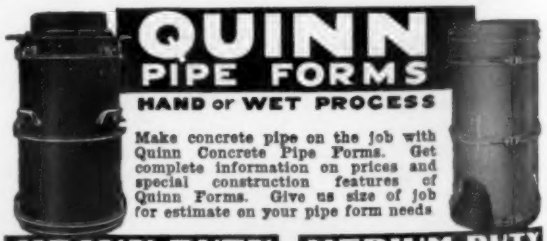

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Prepared by
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Author of "The Law of
City Planning and Zoning"

Zoning and Planning Notes

With the cooperation of
EDWARD M. BASSETT
Author of "Zoning" and of
"The Master Plan"

Zoning Ordinance—Boundary Lines of Districts

ILLINOIS.—*Speroni v. Board of Appeals of City of Sterling*, 15 N. E. 2d 302 (Supreme Court, April 20, 1938).—Minor inaccuracies in description of boundaries of districts will not vitiate the zoning ordinance. Petitioner could not attack the zoning ordinance for ambiguities in description of boundaries of a commercial district so far removed from his property that he could not possibly be prejudiced by them. A zoning ordinance is not arbitrary or unreasonable because some boundary lines bisected a number of lots, as against a property owner whose lot was not so divided.

Probibition of Use Within Given Distance of Another Use—Church

MARYLAND.—*Miles v. McKinney*, 199 Atl. 540 (Court of Appeals, May 20, 1938.—In an ordinance of Baltimore City prohibiting the use of any building for the sale of gasoline within 300 feet of any building used as a "church," that word means a building wholly dedicated to purposes of religious worship.

Where a pastor rented a room in a building otherwise used for residence purposes and with a small congregation conducted regular religious services in this room, and similarly used a floor of another building originally constructed for religious purposes, the other floor being used for the storage of building material, these buildings, under the ordinance, were not buildings used as "churches," so as to prevent the erection of a filling station within 300 feet of them.

Zoning Ordinance

Board of Appeals, Variance for Practical Difficulty or Unnecessary Hardship—Review of Previous Decision on Account of Change of Plans for Building

NEW YORK.—*Matter of Home Life Insurance Company (Murdock)*, Supreme Court, Kings County, reported in *New York Law Journal*, July 9, 1936, page 81.—The property in question is located in a residential zoning district. An application was made in June, 1923, for a permit to erect on it a three-story brick building to be occupied as stores on the ground floor and dwellings above. The application was granted as a variance, on the ground of hardship, by the Board of Standards and Appeals on condition that all permits be obtained within six months and the construction thereafter completed within eighteen months. These conditions were never complied with.

In 1937 a new application was filed to permit the erection on these premises of a store building one story in height. This application was denied, and the determination to deny affirmed by the Court.

The petitioner now asserts that the present application is based upon new and revised plans substantially changing the character of the proposed structure. The Board denied the application on the ground that it had previously been found that there were no practical difficulties or unnecessary hardships, and that a mere change of plans did not constitute a sufficient justification for reviewing the previous determination. This determination the Court sustains, saying:

> "The petitioner has not adduced any new or additional facts to warrant rehearing of the original application. It has merely offered revised plans for the building, but it does not purport to show that there has been any change so far as practical difficulties or unnecessary hardships are concerned. There was no reason, therefore, for the Board to review its previous determination."

Zoning Ordinance — Limitation of Height of Fences and Walls—View Clearance

NORTH CAROLINA.—*Wells v. Housing* 197 S. E. 706 (Supreme Court, June 22, 1938.)—A zoning ordinance limited fences and walls other than necessary retaining walls to a height of 5 and 6 feet respectively. This limitation the Court holds to be constitutional, saying:

> "The present motorized age has created much more rapid and congested traffic on the public streets of cities, greatly increasing the hazard of traffic for pedestrians and the users of vehicles alike. This in turn demands and requires legislation much more restrictive of individual rights than has heretofore been known to the law. The safety of the public now requires open and unobstructed street crossings and intersections. Large and congested urban areas increase fire hazards, requiring regulations which would be oppressive in rural sections or small villages; and while esthetic considerations are by no means controlling, it is not inappropriate to give some weight to them in determining the reasonableness of the law under consideration."

From photographs it appears "that the users of automobiles entering the street from the alley at the rear of the petitioners' property would cross the sidewalks of Mayflower Drive from behind a solid wall more than 15 feet high. It cannot be said that this would not increase the hazard to pedestrians on Mayflower Drive, as well as to vehicular travel on the street. . . . The wall encloses the rear portion of petitioner's house and is high enough to conceal the larger portion of the rear end of the house. It is reasonable to assume that in case of fire this wall would materially hamper the fire department in extinguishing the fire on the petitioner's property or on adjoining property."

EDITOR'S NOTE.—For a somewhat different viewpoint with regard to the limitation of the height of fences and walls, see the Ohio case of *Wandrack v. Kelley* in our Notes for June, 1935. On the subject of vision clearance see our Notes for December, 1934.

Public Housing—Slum Clearance—Eminent Domain

OKLAHOMA.—*Oklahoma City v. Sanders*, 94 Fed. 2d, 323 (Circuit Court of Appeals, Tenth Circuit, January 8, 1938).—In October, 1935, the United States, by authority of Federal statutes and with the consent of the state of Oklahoma, purchased certain lands within the city, on which to construct buildings and improvements for a "low-cost housing project." By Oklahoma statute exclusive jurisdiction over these lands was ceded to the United States for all purposes except the service of state civil and criminal process. Construction having been begun, the city is attempting to enforce certain municipal codes and ordinances with regard to inspection and permits.

The Congress of the United States has declared such a low-cost housing and slum clearance project to be a public use, authorizing the acquisition of land by purchase or eminent domain. Through such a project elimination of insanitary and unhealthy conditions is brought about by clearing such premises of such buildings and removing the degraded and unwholesome conditions existing in such surroundings, thereby preventing illness, disease and crime, and aiding the health, morals and safety of the community. It may be that some parts of the nation may not immediately feel the benefits of such activity, but the increase of employment and stimulation of industry and reduction of illness, disease and crime has a beneficial effect upon the nation as a whole and promotes the public welfare. Zoning in congested urban communities is a precursor of low-cost housing and slum clearance projects.

Under our present system, the municipal or state police power having been lodged and reserved in the state, a corresponding power in appropriate cases arises under the general welfare provision contained in the Federal Constitution, Article 1, Section 8, Clause 1.

The cession of exclusive jurisdiction over premises acquired by the United States Government included the power of regulation or control in such matters as ordinarily fall within the police power of the state, and in such cases the state cannot enforce municipal ordinances such as those relating to inspection and permits.

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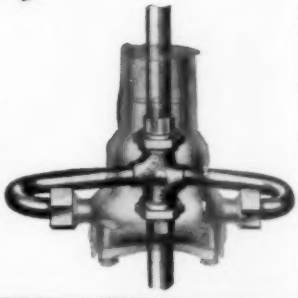

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The City's Legal Rights and Duties

Conducted by A. L. H. STREET, Attorney at Law

Accidents

City held liable for injury to person who slipped from ice-covered safety island in street and fell under street car he was about to board (Illinois Appellate Court: *Strappelli v. City of Chicago*, 14 N. E. 2d, 986).

City held not liable for drowning of boy who trespassed upon sewer pool maintained by city at isolated spot (South Dakota Supreme Court: *Morris v. City of Britton*, 279 N. W. 531).

Town held liable to sled coaster for injury resulting from town's placing pipe on surface of street set apart for coasting (New Jersey Court of Errors and Appeals: *Fisher v. Town of Nutley*, 199 Atl. 40).

City held liable for injury to pedestrian who slipped on sidewalk ice that froze from water used in fighting fire three days before (New York Supreme Court, Appellate Division: *Crandall v. City of Amsterdam*, 4 N. Y. Supp. 2d, 372).

Where automobile driven on street at night, with light conditions affected by trees along street, was deflected over curb and into tree by wooden ramp along curb, held that jury could find city liable for resulting injuries (North Carolina Supreme Court: *Ferguson v. City of Asheville*, 197 S. E. 146).

City held not liable for motorist's collision with brush and tree limbs piled along roadside where it was not shown that the city piled them there or knew they were there or that they had been there more than two or three hours (Georgia Court of Appeals: *City of Barnesville v. Sappington*, 197 S. E. 342).

Bond Issues

Under statute, city held empowered to fund floating indebtedness accumulated in two years where the debts contracted in each year did not exceed the revenues for that year (Kentucky Court of Appeals: *Root v. City of Newport*, 117 S. W. 2d, 594).

Irregularities in original bond issue validated by court decree held no ground for defeating validation of refunding bonds (Florida Supreme Court: *Farrow v. City of Hialeah*, 181 So. 838).

City issuing bonds anticipating special assessment collections held estopped to deny that collections constituted a trust fund for the benefit of the bondholders, even if the bonds were irregularly issued because not authorized by the municipal electors (United States Circuit Court of Appeals, Seventh Circuit: *Bank of Burlington v. City of Murphysboro, Ill.*, 96 Fed. 2d, 899).

Proposed electric bond issue redeemable out of plant revenues held not invalid as contingently burdening general revenues of city (Utah Supreme Court: *Utah Power & Light Co. v. Ogden City*, 79 Pac. 2d, 61).

Contracts

Contract for payment of commissions on escaped taxes collected for city by contractor held invalid because not attested by City Clerk as required by statute (Alabama Supreme Court: *Council v. City of Dothan*, 181 So. 293).

Village contract for purchase of 150-hp diesel engine for its existing power plant held invalid, in suit by taxpayers to enjoin consummation of the contract, where there were numerous sources from which such an engine might be bought but no call for bids, as required by statute (Wisconsin Supreme Court: *Victoria v. Village of Muscoda*, 279 N. W. 663).

Engineer's approval of dam before there was water behind it held not to relieve contractor from liability for breach of a specification that dam must be watertight, the defects in construction not being known when the engineer gave his approval (Iowa Supreme Court: *City of Osceola v. Gjellefald Construction Co.*, 279 N. W. 590).

Paving contractor held bound to know that council could not award contract not supported by statutory resolution of necessity passed by three-fourths vote (Iowa Supreme Court: *Lytle v. City of Ames*, 279 N. W. 453).

Council Proceedings

Burgess held empowered to break tie votes of borough council in selection of officers, etc. (Pennsylvania Court of Common Pleas, Lackawanna County: *Commonwealth v. Ott*, 29 Pa. Mun. Law Rep. 212).

Depositories

State's right of preference in distribution of assets of insolvent banks held not to extend to deposits of municipal funds (Alabama Supreme Court: *State v. Williams*, 181 So. 792).

Licenses

Ordinance licensing food-dispensing establishments under direction of commissioner of health held a valid exercise of police power (Illinois Supreme Court: *City of Chicago v. R. & X. Restaurant, Inc.*, 15 N. E. 2d, 725).

Ordinance imposing license fee of $125 per quarter on beauty culture schools upheld (California District Court of Appeal: *Auston v. Wilson*, 80 Pac. 2d, 503).

A prosecution for violating a licensing ordinance being a civil, not a criminal, proceeding, the city has a right to appeal from an adverse decision (Michigan Supreme Court: *City of Ann Arbor v. Riksen*, 279 N. W. 513).

Municipal Offenses

Persons conducting religious meeting on a beach without a permit held properly convicted of disorderly conduct and violation of ordinance regulating installation of electrical equipment (New Jersey Supreme Court: *Dallas v. Atlantic City*, 199 Atl. 731).

Official Bonds

Police officer's bond held available to person aggrieved by officer's wrongful use of pistol as means of coercing submission to arrest (West Virginia Supreme Court of Appeals: *State v. Spangler*, 197 S. E. 360).

Official Tenure

Police chief discharged before expiration of term without cause, in violation of ordinance, held entitled to salary (South Carolina Supreme Court: *Edge v. Town of Cayce*, 197 S. E. 216).

Ordinances

Original ordinance held unaffected by subsequent ordinance purporting to amend and repeal its provisions, where subsequent ordinance was invalid as an amendatory ordinance because not published, as required by statute (Illinois Appellate Court: *City of Sterling v. Berry*, 15 N. E. 2d. 527).

Non-residents while within the limits of a city held bound by the city's ordinances (United States Circuit Court of Appeals, Ninth Circuit: *Southern Pacific Co. v. Humphrey*, 97 Fed. 2d, 29).

Ordinance not signed by Mayor, as required by statute, held inoperative (Louisiana Court of Appeal: *Martin v. Yazoo & Mississippi Railroad Co.*, 181 So. 571).

Public Utilities

City as operator of subway, in a proprietary and not a governmental capacity, held bound to bear the cost of relocating a telephone company's underground facilities to accommodate new subway stairways, etc., in absence of statute to the contrary (New York Court of Appeals: *City of New York v. New York Telephone Co.*, 14 N. E. 2d, 831).

City Council's resolution continuing existing gas rates held to have remained in effect despite later resolution ordering gas company to reduce its rates, on the latter resolution's being adjudged void by Court as being confiscatory (United States Circuit Court of Appeals, Eighth Circuit: *Arkansas-Louisiana Gas Co. v. City of Texarkana, Ark.*, 96 Fed. 2d, 179).

Purchases

City never having been evicted from land quitclaimed to it by county, held liable on warrants issued for price, even if county lacked title to property (Texas Court of Civil Appeals: *Atascosa County v. City of Pleasanton*, 117 S. W. 2d, 484).

Recall Proceedings

City Commissioner suing to enjoin Clerk from proceeding with recall election held to have failed to sustain burden of showing that proceedings did not substantially conform to statutory requirements (Florida Supreme Court: *DuBose v. Kelly*, 181 So. 11).

Referenda

General appropriation resolution adopted by City Council held not subject to referendum provisions of city charter, because relating to statewide interests concerning support of poor, maintenance of highways, etc., and not limited to municipal affairs (Maine Supreme Judicial Court: *Burkett v. Youngs*, 199 Atl. 619).

Sewers

Statutory and constitutional provisions relating to municipal "sewerage" systems held to apply to storm sewers as well as sanitary sewers (Wyoming Supreme Court: *Anselmi v. City of Rock Springs*, 80 Pac. 2d, 419).

Farmer held entitled to enjoin pollution of stream through discharge of municipal sewage, subject, however, to the municipality's being afforded reasonable opportunity to adopt substitute measures for disposal of the sewage (Maryland Court of Appeals: *Livezey v. Town of Belair*, 199 Atl. 838).

Sidewalks

Where, many years before, abutter built a 10-foot public sidewalk along a strip of ground fronting on street, city held empowered to widen street for vehicular travel by cutting the sidewalk to a width of 4½ feet (Kentucky Court of Appeals: *City of Fulton v. Penny*, 116 S. W. 2d, 963).

Streets

City held empowered to exchange one triangle of land for another needed for street purposes, in compromise of a condemnation proceeding (Texas Court of Civil Appeals: *Smith v. Special Assessment Securities Corp.*, 116 S. W. 2d, 1166).

Ordinance forbidding storage of automobiles in streets upheld (Ohio Supreme Court: *Plummer v. Village of Swanton*, 15 N. E. 2d, 349).

Charter prohibition against reassessment of abutting property for street improvement within ten years held waived by abutter who petitioned for new improvement, thereby precluding his successor in ownership from questioning the validity of the new assessment (North Carolina Supreme Court: *Metropolitan Life Insurance Co. v. City of Charlotte*, 196 S. E. 809).

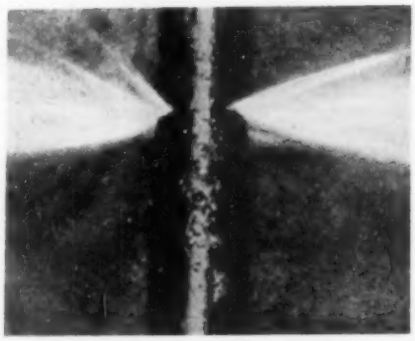
Taxation

Sales tax ordinance upheld against objections that it involved duplicate taxation (Pennsylvania Supreme Court: *Blauner's Inc. v. City of Philadelphia*, 198 Atl. 889). And against objection that the tax was not uniform because providing for disregarding of fractions of cents in computing tax (Same court: *Wilson v. City of Philadelphia*, 198 Atl. 893).

Traffic Regulations

Game warden held not exempt from obedience to speed ordinance while going to investigate complaint of illegal trapping, under statute exempting "police vehicles," especially when he detoured on a personal errand (City Court, Rochester, N. Y.: *City of Rochester v. Linder*, 4 N. Y. Supp. 2d, 4).

A HALF-MILLION-DOLLAR LEAK???



So far as we know—

Such a leak has yet to be discovered, but—last year, Pitometer engineers found a leak in a Massachusetts city that was costing the city $60.30 per day—a water loss of 220,095,000 gallons per year—and at the time it was stated:

"There is no way of estimating when the leak started. It might have been going on for all of the 20 years that the old pipe was in place—7,300 days—bringing the cost to $440,190."

PITOMETER'S BIG 3 SERVICES

One *include not only* WATER WASTE SURVEYS, locating all hidden leaks and other sources of water waste, accounting for all the water that enters the distribution system, *but they also include*:

Two TRUNK MAIN SURVEYS—to ascertain which mains are overtaxed with resultant loss of pressure, and which mains are not doing all the work for which they were designed—*and*—

Three DISTRIBUTION SYSTEM STUDIES—to determine necessary extensions and replacements to meet present needs and future requirements over a 25-year period.

No. 1 above is explained in Bulletin No. 17; Nos. 2 and 3, in Bulletin No. 18. Write for copies; or write us frankly, telling us just what you feel is wrong with your water system and let us make a casual survey and recommendations without obligation on your part.

THE PITOMETER COMPANY
Water Distribution Engineers
52 Church St. New York

Johnson City Fire Hydrant

Not just another hydrant—but one designed to overcome difficulties heretofore troublesome to water works men and fire chiefs . . . with an *extra factor of safety* for severe service.

Not easily damaged; but *if* ever injured, easily and quickly repaired without shutting off the line and without digging.

Write for circular giving complete details.

Johnson City Foundry & Machine Co.
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Coagulant Mixing
Contact Mixing
Recarbonation
Filtered Water Aeration

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Trickling Filter Auxiliary
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A type and capacity to fit every existing or contemplated plant.

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He is telling Park and Playground Superintendents, Water Works Superintendents, Mayors, Boards of Education and Health Officers:—

"The MURDOCK is the ultra-modern, rust-proof, trouble-free drinking fountain, approved by more than 900 cities."

Write for full particulars of our improved fountains. If you have *old* Murdock fountains, let us modernize them.

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Cincinnati *Since 1853* Ohio

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Municipal and Civic Publications

Prices quoted do not include postage, unless so stated

Construction

Estimates and Costs of Construction.—By Frank Whitworth Stubbs, Jr., Professor of Civil Engineering and Head of Department, Rhode Island State College. John Wiley & Sons, Inc., New York. 1938. VIII + 234 pp. $3.00 from THE AMERICAN CITY.

While this book is intended primarily for college or technical classroom use, the author has prepared a very helpful volume with a wealth of detailed information valuable to the municipal engineer and to the younger men in the construction field. It covers approximate and detailed estimates for a wide variety of work, construction by contract and day labor, construction cost keeping and reports, and the important subjects of financing, depreciation and economic selection.

Traffic

"Enforcement for Traffic Safety" is the third of three handbooks dealing with three coordinate functions in traffic administration—engineering, education, enforcement. It sets forth the requirements of good traffic-law enforcement, and presents in practical and convenient form the most efficient and effective ways of eliminating traffic accidents. Emphasized throughout the pamphlet is the principle that the essence of good enforcement consists not in indiscriminate and haphazard control, but in control at vulnerable points: attacking those violations which cause the most and worst accidents. To devote a great many man-hours to enforcing regulations which have no direct relation to accident prevention—such as certain parking regulations, for example—is beside the point and inefficient. This pamphlet should be helpful to those persons having to do with traffic enforcement, in suggesting ways of arriving at the maximum permanent highway safety with the minimum man-hours and consequent expenditure.

Covered in the pamphlet are the following general topics: laws and ordinances, drivers' license administration, inspection of vehicles, the courts, the traffic police force, reports and records, traffic facilities. 47 pp. (Apply to the National Safety Council, Inc., 20 N. Wacker Drive, Chicago, Ill.)

Police

The Yearbook of the International Association of Chiefs of Police, 1937-38, containing material drawn largely from papers presented at the forty-fourth annual convention of the Association, at Baltimore, in October, 1937, forms a record of the year's progress in standards of police administration, new techniques and procedures. The volume contains, as some of the highlights, a discussion of the National Police Academy and the professional training it offers; the Traffic Institute, the radio traffic check, new tests for intoxication, and other methods in operation toward a solution of our alarming accident rate; a program for boys which attempts to curb juvenile delinquency at its outset; the advances made in police records and criminal identification; the need for a record of police experience in the handling of public disorders; and the necessity for international police cooperation. Included also are a condensed record of the proceedings of the convention, and a list of the Association's personnel. 254 pp. $2.50. (Apply to Public Administration Service, 1313 E. 60th St., Chicago, Ill.)

Sewers

The Annual Report of the Superintendent of Sewers of the City of Worcester for the year 1937 summarizes the work done, improvements made, and expenditures, for the various phases of the work of the sewer department—construction, maintenance, purification. Besides the factual data, which are presented in table as well as statement form, there is a discussion of department problems, reasons for necessary inefficiencies, and suggestions for improvements. 8 pp. + 37 pp. of tables. Mimeographed. (Apply to John H. Brooks, Jr., Supt. of Sewers, Worcester, Mass.)

Population Problems

The Problems of a Changing Population.—National Resources Committee. United States Government Printing Office, Washington. 1938. 306 pp. 75c (paper cover).

With its panoramic view of the shifting peoples on the face of this country, its glimpse into the future, this volume, although scientific and scholarly, makes a strong appeal to the imagination.

As emphasized in the Foreword, it "does not deal merely with problems regarding the quantity, quality and distribution of population, important as they are, but also with the widening of opportunities for the individuals making up this population, no matter how many or where they are." Its scope is broad and comprehensive, covering a large sector of the social field; its implications and ramifications are far-reaching. Indicative of this scope is the following list of subjects covered: present trends toward a stable population; changing age distribution, declining birth rate, and increasing proportion of older people; inequality in economic opportunity and standard of living in various parts of the country; redistribution of population from one part of the country to another, from country to city; regional and racial differences in reproduction rates and social and economic conditions affecting birth rates; variations and trends in health and physical development among American groups and the problem of mental disease; education in relation to other national trends; cultural diversity in American life.

Apart from its recommendations for the solution of special problems, this study should prove valuable in pointing out the importance and implications of studies of population trends; and in correlating many usually detached elements of the social and economic field under one heading.

Highway Zoning

"One thousand miles of paved highways and roads free from billboards and protected from business"! Even the photographs of these clean sweeps of unscarred roadway, in a pamphlet on highway zoning in California, are a joy and rest to billboard-weary eyes. The study was made by the National Roadside Council, financed by the American Nature Association, and outlines highway zoning progress and lack of progress in various counties of California, following the adoption of the State Planning Act in 1929. It contains discussions of the problems and opposition encountered and results achieved in the restriction of business and control of architecture of buildings along highways, in the prohibition of billboards and removal of those already standing, and in the location and design of highways. 30 pp. 12 copies for $1. (Apply to the American Nature Association, 1214 Sixteenth Street, N. W., Washington, D. C.)

Highway Conference

The "Proceedings of the Twenty-fourth Annual Highway Conference," which was held at the College of Engineering of the University of Michigan from February 15 to 17 of this year, covers the following general subjects: highway planning surveys, and highway maps; finance and taxation; the utility and recreational use of the highways; street lighting; parking problems; highway and traffic safety—enforcement, education and road design (multiple-lane highways, divided highways and freeways.) It is interesting to note the emphasis that is laid throughout on the importance of highway planning surveys in the solution of increasingly complex highway and traffic problems with proportionately fewer funds.

In an unusual talk on traffic safety, Dr. Lowell S. Selling, of the Recorder's Court Clinic in Detroit, pointed out the surprising fact that, contrary to common belief, factors such as reaction time or deafness do not make for accidents, while certain general psychological attitudes and traits such as egocentricity, daydreaming, etc., are common causes of accidents. 255 pp. (Apply to Univ. of Mich., Ann Arbor, Mich.)

The Tennessee Valley Authority

The Tennessee Valley Authority: A National Experiment in Regionalism.—By Clarence Lewis Hodge, Ph.D. The American University Press, Washington, D. C. 1938. xii + 272 pp. $3.00.

With the front pages of the newspapers covered with the controversies between the Tennessee Valley Authority and the power utilities, and the conflict among its directors, readers are apt to miss the significance of the TVA as a national experiment in the field of government and planning. This critical and scholarly study analyzes the "nature, accomplishments, and failures of the regional work" of the TVA from the point of view of its serving as a pattern for possible future regional authorities which may be established as a result of the present-day trend toward regionalism in America. Particular stress is laid on the wide cooperation of the TVA with local, state and Federal agencies, and lay or voluntary organizations; the Authority's relations with some 239 of these, and the techniques and methods it uses to secure cooperation are described. The author points out the importance of this aspect of the TVA as a "guaranty against overcentralization in government planning and against decay of local government interest."

To regional and city planners and forward-looking government officials, this study of America's most important experiment in regionalism, and its implications, should prove most stimulating.

Public Works Planning

Long set aside as a refuge for Indians, Oklahoma, when it was opened to white settlement, developed with even more rapidity and less plan than most of the states of the Union. For this reason, it has been in particular need of planning.

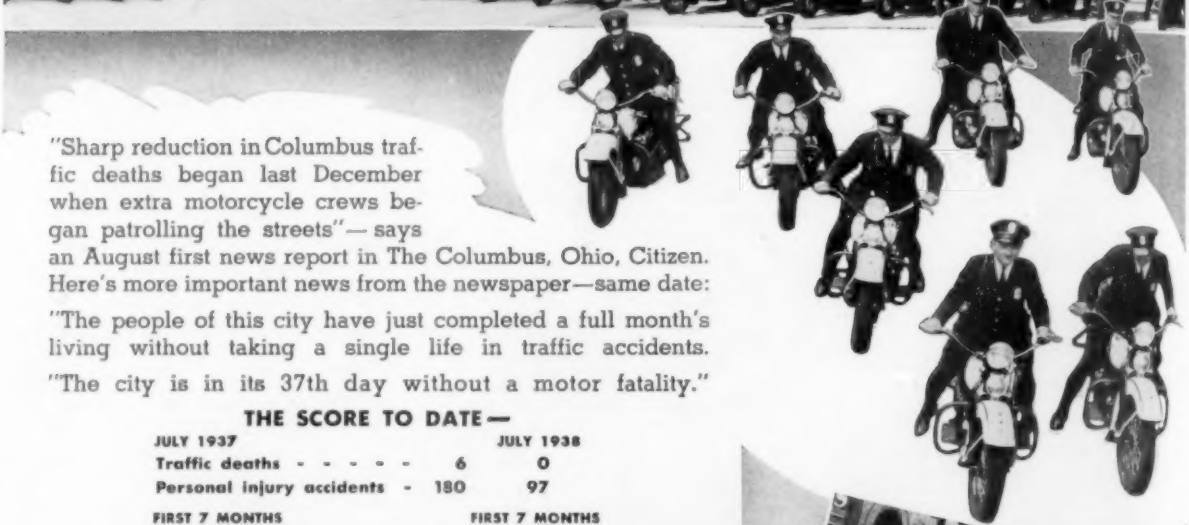
"A Report on Public Works Planning," prepared by the Division of State Planning of the Oklahoma Planning and Resources Board, deals not only with problems of public works planning in Oklahoma, but presents in interesting and graphic fashion general principles and essentials of public works planning anywhere. (See page 62 of this issue.) Besides charts and maps, one of the effective features which the report uses to bring home its points is photographs showing concrete examples of good and bad planning.

The report discusses the importance of planning Oklahoma's public works projects in relation to its social and economic development, with a view to best land use, population trends, periods of unemployment and scant private building, local financial ability. The results are given of an inventory made of those projects most desired by local governments in the six years following 1936, with suggestions for a program of action in planning future public works projects. 54 photo offset pp. (Apply to Oklahoma Planning and Resources Board, Division of State Planning, Oklahoma City.)

Vital Statistics in Pittsburgh

The Bureau of Social Research of the Federation of Social Agencies of Pittsburgh & Allegheny County is undertaking a series of studies of the vital statistics of Pittsburgh, based largely on a comprehensive tabulation by the Bureau of Infectious Diseases of the City Department of Health covering the period from 1930 to 1936. The first in this series, "Diphtheria Mortality and Morbidity in Pittsburgh" by Mildred Stahl Fletcher, demonstrates the progress made by the City Department of Health in the prevention of this disease. It describes the discoveries that have been made to aid prevention and cure and the public campaigns for education and immunization. It also shows that further preventive work is necessary and analyzes the comparative willingness of Pittsburgh and its divisions to avail themselves of all possible resources to completely conquer diphtheria. 20 pp. 25c. (Apply to the Bureau of Social Research, Federation of Social Agencies of Pittsburgh & Allegheny County, 519 Smithfield St., Pittsburgh, Pa.)

COLUMBUS, OHIO SCORES *Victory* OVER TRAFFIC DEATHS



"Sharp reduction in Columbus traffic deaths began last December when extra motorcycle crews began patrolling the streets"— says an August first news report in The Columbus, Ohio, Citizen. Here's more important news from the newspaper—same date:

"The people of this city have just completed a full month's living without taking a single life in traffic accidents.

"The city is in its 37th day without a motor fatality."

THE SCORE TO DATE—

JULY 1937		JULY 1938
Traffic deaths - - - - -	6	0
Personal injury accidents -	180	97
FIRST 7 MONTHS 1937		**FIRST 7 MONTHS 1938**
Traffic deaths - - - - -	50	22
Personal injury accidents -	1324	808

Six lives saved, 83 persons saved from injury in a single month! 26 lives saved, 516 persons saved from injury in seven months! What a tribute to the efficiency of the Columbus traffic officers and their dependable Harley-Davidson motorcycles!

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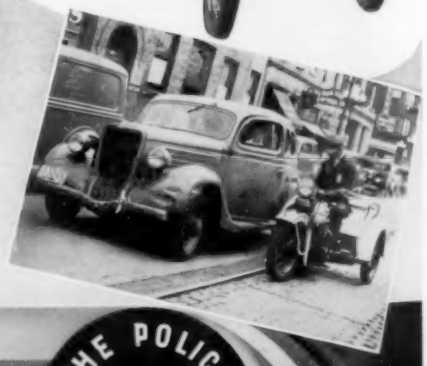

Harley-Davidson THE POLICE MOTORCYCLE

Aluminum Design Problems

Structural Aluminum Handbook.— Aluminum Company of America, Pittsburgh, Pa. 1938. 211 *pp.* $1.25, *postage prepaid.*

This is the enlarged second edition of a useful handbook published in 1930, by the Aluminum Company of America, on the design problems of aluminum. The contents cover the following subjects: characteristics, manufacture, and fabrication; design; elements of sections; technical data; specifications, tolerances, and commercial sizes; conversion tables. Presented in this second edition, for the first time, is information regarding the ultimate strength of structural members fabricated from aluminum alloys.

The handbook is in easy reference form, being indexed, and consisting largely of tables, charts, and examples, with brief discussion paragraphs.

Slums of New York

Slums of New York.—By Harry Manuel Shulman. Albert & Charles Boni, Inc., New York. 1938. *xiii* + 653 *pp.*. $5.00 *from* THE AMERICAN CITY.

With present-day emphasis on the importance of decent housing in the slums, it is easy to think of the slum as merely a group of dilapidated buildings, forgetting its implications as a social phenomenon. It is almost a surprise, then, to find a book with the title "Slums of New York," which does not lay its principal stress on housing. Sponsored by the Boys Work Committee of the Rotary Club of New York, this book is a social study of family and neighborhood life in four slum sections of New York City, with particular reference to the conditions and opportunities of boys in these sections. It reports and analyzes two surveys, the first made during the prosperity year of 1926, the second during the depression period of 1931-32.

Population trends, racial patterns, housing, family life, employment, health, recreation and crime are among the aspects of these areas covered in this extensive volume. In the author's opinion the solution of the slum problem rests not so much in physical rehabilitation through better housing as it does in re-education principally through the school. The tremendous re-adaptation of the whole system of education which this concept would require is outlined, with suggestions for its possible carrying-out.

The significance of this study lies in the period of time covered, extent of area and individuals involved, and range of aspects studied. To educators and social workers, as well as all others interested in civic welfare, the book should prove fruitful reading.

Housing

Now that the importance of housing for low-income groups is generally recognized, and at least the beginnings are here of what it is confidently hoped will be an extensive period of building, the aspect of housing which requires next immediate attention is that of housing standards. It is essential that houses which are built now shall not become the slums of tomorrow.

Dealing with this subject is the April-May-June issue of *The Commonhealth*, published by the Massachusetts Department of Health and entitled "The Hygiene of Housing." Comprehensive in scope, it consists of articles by different authorities in the field, covering or touching on most of the principal aspects of housing in their relation to healthful housing. These include: disease; physical standards—construction and design, heating, lighting, ventilation, sanitation, play spaces and yards, gardens, decorating; planning; economic problems; legislation; government participation and control; social aspects; rehabilitation; management.

The bulletin is general in treatment and does not limit itself to Massachusetts problems. 94 pp. Free to citizens of the state. (Apply to Mass. Dept. of Public Health, Boston, Mass.)

Building Codes

The Municipal Reference Library has published a reprint of Chapters 5, 6, 7, 8 and 9 of the revised Building Code of the City of Chicago, passed by the City Council June 3 and 10 of this year. These chapters of the Code relate to definitions, general occupancy provisions, single dwellings, multiple dwellings and institutional buildings. 37 mimeographed pp. with 4-page index. 15c. (Apply to the Municipal Reference Library, 1005 City Hall, Chicago, Ill.)

City Government

History of American City Government—The Colonial Period.—By Ernest S. Griffith. Oxford University Press, New York. 1938. 464 *pp.* $3.75 *from* THE AMERICAN CITY.

This is the first of three or four projected volumes to cover the history of city government in the United States—the first such history, surprisingly enough, that has been written. This volume covers the colonial period in American history before the Revolution, when British influence determined the form of municipal government, and distinctly American traditions had scarcely begun to develop. It is a study of the "political city," but is written with an awareness of economic and cultural influences and interactions.

The material is handled by topics rather than chronologically, since, as the author points out, at this stage in its development the evolution of the city depended almost entirely upon changes in size rather than the period in time or any changes in ideas. Among other subjects, the following are discussed: the colonial municipal charter; the incorporation of cities and what this constituted; municipal control of economic life; the internal constitution of the colonial borough; popular participation in government and public opinion; the emergence of urbanism from the informal, intimate community; the financing of colonial municipalities; the relations of municipalities to the governments of their colonies; and a general analysis of the "quality" of government during this period, and its contribution to American municipal development.

Industrial Development

Growth of American Manufacturing Areas.—By Glenn E. McLaughlin. Published by Bureau of Business Research, University of Pittsburgh, Pittsburgh, Pa. 1938. *xxvii* + 358 *pp.* $3.00.

In attempting to compute measures of industrial growth for the Pittsburgh district, the Bureau of Business Research recognized that in order to intelligently appraise the present position and future prospects of the district, it would be necessary to measure long-time trends in relation to the nation as a whole and other competing centers. Consequently, this study dealing with variations in the growth of industry in major areas was undertaken. The material is grouped under two headings: Part I, Measurement and Statistical Analysis; Part II, Interpretation. Under Part I, "Gainful Workers, 1870-1930," "Population, 1870-1930," "Manufacturing Wage Earners, 1869-1935," and "Value Added by Manufacture, 1869-1935," are the subjects analyzed. Under Part II are three sections dealing with "Reasons for Regional Differences in the Rate of Industrial Growth," "Population and Industrial Production in the Pittsburgh District," and "The Position of the Pittsburgh District."

Health

"The Magnitude of the Chronic Disease Problem in the United States" is the title of a report published by the United States Public Health Service, giving data on the prevalence of the various chronic diseases in the United States; their extent as a cause of loss of work, of disability, and of mortality; the relation of chronic diseases to age and income. A summary of these data indicates the total size of this national problem, and the relative significance of particular diseases as factors of the problem. 19 photo offset pp. (Apply to Division of Public Health Methods, U. S. Public Health Service, Washington, D. C.)

Research Work of the WPA

A brief pamphlet entitled "Research Work on Projects of the Works Progress Administration" gives a good idea of the nature and results of this type of WPA work. First of all, it has trained many in work with statistics and research and has convinced many local governments of the value of statistical projects. Beyond that, the outcome of specific records projects has been to increase in efficiency, accuracy and accessibility local records essential to the effective operation of governmental units. As a tangible result of research projects, the WPA has built up a body of reports consisting of more than 3,000 items dealing with housing and real property, transportation and traffic, public finance, government and public administration, health and public welfare, education and many other subjects. 11 pp. (Apply to the Works Progress Administration, Washington, D. C.)

Recreation

The New Play Areas—Their Design and Equipment—Edited for the National Recreation Association by George D. Butler. A. S. Barnes and Co., New York. 1938. *xiii* + 242 *pp.* $3.00 *from* THE AMERICAN CITY.

This is the second edition of the convenient volume, "Play Areas—Their Design and Equipment," published in 1928. It has been completely revised and enlarged to bring it up to date with the marked progress that has been made in the development of play areas during this ten-year period. "New Play Areas" is primarily concerned with three types of play areas: the children's playground, the neighborhood playfield, and the athletic field, to each of which a chapter is devoted. Other chapters describe and discuss: general play area features; playground apparatus; pools, structures, equipment and supplies; landscape design and development; preparation of play areas for winter use; with an appendix on the "Engineer's Problem in the Construction of a Modern 10-Acre Playfield."

It is a book which, like its predecessor, will be most useful to landscape architects, city planners and anyone having to do with the planning of playground development and facilities or the purchasing of playground equipment. It has numerous features which make it a practical reference book: it is profusely illustrated with specifications, plans, diagrams and photographs of actual examples of points discussed; it is indexed; a comprehensive bibliography is included; and even the cover looks as though it could stand being left without damage on a playground bench in the rain.

Parks

"In the settlement of a country some lands are more suited to farming, others to grazing, others to forestry and mining. But some lands are more suitable for the inspiration, or recreation, of the people—breathing spaces, they might be called."

"Portfolio on the National Parks and Monument System," from which the above quotation is taken, is a set of four folders issued by the American Planning and Civic Association presenting an account of the type of areas and the service rendered in the national parks and monuments. They consist largely of fine photographs of the spots of scenic beauty and historic interest in the United States, which, to a city desk-sitter, are no less than inspirational. The first folder, "What Are National Parks?," deals with the reasons for setting land aside for national parks; the second, "Conservation of Nature," describes three phases of wilderness conservation—rocks and other geological records, trees and vegetation, and animals; the third, "Preservation of History," is an account of the preservation of Indian and early American dwellings, museums and relics of historical interest; and the fourth, "Facilities and Services," describes the trails and roads, camping facilities, guide and other services of the national parks.

In this land so rich in outdoor beauty and wild nature, the parks are performing a national service which will indeed "build and strengthen the fabric of growing American culture." 32 pp. each folder. 75c postpaid for set. (Apply to American Planning and Civic Assn., 901 Union Trust Bldg., Washington, D. C.

Other Reports Received

AUGUSTA, GA.—Year Book of the City Council, 1937. 109 pp.

CINCINNATI, OHIO.—"Cincinnati Municipal Activities, 1937." 75 pp.

ELMIRA, NEW YORK.—Proceedings of the Twenty-Ninth Annual Meeting of the Conference of Mayors and Other Municipal Officials of the State of New York. 1938. 137 pp.

LARCHMONT, N. Y.—Annual Report, 1937-8. 36 pp.

LOS ANGELES, CALIF.—Annual Report, Board of Park Commissioners, 1936-7. 56 pp.

NEW YORK, N. Y.—54th Annual Report, Municipal Civil Service Commission, 1937. 96 pp.

PASADENA, CALIF.—Annual Report of the City Manager, 1936-37. 55 pp.

PORTLAND, ORE.—"Civic Review," 1937. 72 pp.

PORTLAND, ORE.—Annual Report of the Auditor, 1937. 158 pp.

TOLEDO, OHIO.—"Toledo's First Two Years of Council-Manager Government." 1936-37. 44 pp.

Statler figures that when a city official goes out of town for a convention or meeting, he should get the kind of service he gets in the city office.

So everything is prepared in advance—meeting rooms, microphone, comfortable chairs and competent attendants. Every Statler employee is on his toes. That is how we are able to give the kind of service that makes city officials ENJOY themselves when they

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Draglines • Dumptors • Mud-Jacks
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During September we hope you will remember to mention THE AMERICAN CITY.

Conventions -- When and Where

Meeting is annual convention unless otherwise designated

SEPTEMBER 12-13.—CASPER, WYO.
American Water Works Association — Rocky Mountain Section. (Townsend Hotel.) Sec.-Treas., B. V. Howe, State Office Bldg., Denver, Colo.

SEPTEMBER 12-15.—BALTIMORE, MD.
International Municipal Signal Association, Inc. (Lord Baltimore Hotel.) Sec., Irvin Shulsinger, 7 E. 42d St., New York.

SEPTEMBER 12-13.—HOT SPRINGS, VA.
League of Virginia Municipalities. (Homestead Hotel.) Exec. Sec., Morton L. Wallerstein, 902 Travelers Bldg., Richmond, Va.

SEPTEMBER 13-16.—BOSTON, MASS.
New England Water Works Association. (Hotel Statler.) Sec., Frank J. Gifford, 613 Statler Bldg., Boston, Mass.

SEPTEMBER 14-16.—SAGINAW, MICH.
American Water Works Association—Michigan Section. (Bancroft Hotel.) Sec., M. N. Gerardy, Water Board Bldg., Detroit, Mich.

SEPTEMBER 14-15.—ROCKFORD, ILL.
Illinois Municipal League. (Hotel Faust.) Sec., A. D. McLarty, 500 E. Capitol Ave., Springfie'd, Ill.

SEPTEMBER 15.—LEBANON, PA.
Pennsylvania Water Works Operators' Association. Sec.-Treas., I. M. Glace, 22 S. 22d St., Harrisburg, Pa.

SEPTEMBER 18-22.—MILWAUKEE, WIS.
American Institute of Park Executives. Exec. Sec., Will O. Doolittle, Box 422, Tulsa, Okla.

SEPTEMBER 19-20.—WATERTOWN, S. DAK.
South Dakota Water and Sewage Works Conference. (Hotel Lincoln.) Sec., W. W. Towne, State Board of Health, Pierre, S. Dak.

SEPTEMBER 22-23.—POUGHKEEPSIE, N. Y.
American Water Works Association—New York Section. (Nelson House.) Sec.-Treas., R. K. Blanchard, 50 W. 50th St., New York.

SEPTEMBER 22-23.—MAMMOTH CAVE, KY.
The Kentucky Municipal League. (Mammoth Cave Hotel.) Exec. Sec., Carl B. Wachs, Administration Bldg., Univ. of Kentucky, Lexington, Ky.

SEPTEMBER 26-29.—BOSTON, MASS.
International City Managers' Association. (Hotel Statler.) Exec. Dir., Clarence E. Ridley, 1313 E. 60th St., Chicago, Ill.

SEPTEMBER 26-28.—MANHATTAN, KANS.
League of Kansas Municipalities. (Hotel Wareham.) Exec. Sec., John G. Stutz, Lawrence, Kans.

SEPTEMBER 26-27.—MINOT, N. DAK.
North Dakota Water and Sewage Works Conference. (Hotel Leland Parker.) Sec.-Treas., M. D. Hollis, Bureau of Sanitary Engineering, Bismarck, N. Dak.

SEPTEMBER 27-30.—NEW ORLEANS, LA.
International Association of Fire Chiefs. (Hotel Roosevelt.) Sec., James J. Mulcahey, 16 Franklin Ave., Yonkers, N. Y.

SEPTEMBER 29-OCTOBER 1.—MINNEAPOLIS, MINN.
American Water Works Association—Minnesota Section. (Hotel Nicollet.) Sec.-Treas., Ronald M. Finch, Wallace & Tiernan Co., Inc., 414 Flour Exchange, Minneapolis, Minn.

SEPTEMBER 29-30.—COLUMBUS, OHIO.
Ohio Conference on Sewage Treatment. (Fort Hayes Hotel.) Sec., B. M. McDill, Dept. of Health, Columbus, Ohio.

OCTOBER 2-7.—ST. PAUL, MINN.
American Prison Association. Congress. General session—Municipal Auditorium; Section meetings—Hotels St. Paul and Lowry. Gen. Sec., E. R. Cass, 135 E. 15th St., New York.

OCTOBER 3-5.—NEW YORK CITY.
American Public Works Association. (Hotel Pennsylvania.) Exec. Dir., Frank W. Herring, 1313 E. 60th St., Chicago, Ill.

OCTOBER 3-6.—TORONTO, ONT.
American Transit Association. (Royal York Hotel.) Gen. Sec., Guy C. Hecker, 292 Madison Ave., New York.

OCTOBER 3-7.—PITTSBURGH, PA.
National Recreation Association. (William Penn Hotel.) Administrative Sec., Thomas E. Rivers, 315 Fourth Ave., New York.

OCTOBER 5-7.—CHICAGO, ILL.
American Municipal Association. (Hotel La Salle.) Exec. Sec., Clifford W. Ham, 1313 E. 60th St., Chicago, Ill.

OCTOBER 5-6.—RACINE, WIS.
Wisconsin Chiefs of Police Association. (Hotel Racine.) Sec., R. H. McCarty, Kaukauna, Wis.

OCTOBER 6-7.—WASHINGTON, D. C.
American Water Works Association—Four States Section. (Hotel Raleigh.) Sec.-Treas., Carl A. Hechmer, Washington Suburban Sanitary District, Hyattsville, Md.

OCTOBER 6-8.—HARTFORD, CONN.
Joint meeting. (Hotel Bond.) *New England Sewage Works Association.* Sec., F. W. Gilcreas, State Dept. of Health, Albany, N. Y. *New York State Sewage Works Association.* Sec.-Treas., A. S. Bedell, State Dept. of Health, Albany, N. Y.

OCTOBER 9-11.—CHICAGO, ILL.
Institute of Traffic Engineers. (Stevens Hotel.) Sec.-Treas., Harold F. Hammond, 60 John St., New York.

OCTOBER 10-12.—MILWAUKEE, WIS.
American Water Works Association—Wisconsin Section. (Plankinton House.) Sec., L. A. Smith, City Hall, Madison, Wis.

OCTOBER 10-13.—GULFPORT-BILOXI, MISS.
Montana National Bituminous Conference. (Edgewater Gulf Hotel.) Montana Highway Department. Address: Gen. Chmn., D. A. McKinnon, State Highway Dept., Helena, Mont. Western Refiners Association. Pres., C. M. Boggs, Tulsa, Okla.

OCTOBER 10-14.—CHICAGO, ILL.
National Association of Public School Business Officials. (Palmer House.) Sec., H. W. Cramblet, Board of Education, Pittsburgh, Pa.

OCTOBER 10-14.—CHICAGO, ILL.
National Safety Council. (Stevens Hotel.) M'ng Dir., W. H. Cameron, 20 N. Wacker Drive, Chicago, Ill.

OCTOBER 11-14.—WASHINGTON, D. C.
National Association of Housing Officials. (Wardman Park Hotel.) Dir., Coleman Woodbury, 1313 E. 60th St., Chicago, Ill.

OCTOBER 12-14.—KEARNEY, NEBR.
League of Nebraska Municipalities. (Fort Kearney Hotel.) Sec.-Treas., C. E. Beals, 204 Brownell Bldg., Lincoln, Nebr.

OCTOBER 13-15.—DES MOINES, IOWA.
American Water Works Association—Missouri Valley Section. (Hotel Fort Des Moines.) Sec., Earl L. Waterman, University of Iowa, Iowa City, Iowa.

OCTOBER 13-14.—NEENAH-MENASHA, WIS.
Central States Sewage Works Association. (Valley Inn.) Sec., W. H. Wisely, State Dept. of Public Health, Springfield, Ill.

OCTOBER 13-14.—MADISON, WIS.
League of Wisconsin Municipalities. Sec., Frederick MacMillin, 30 E. Johnson St., Madison, Wis.

OCTOBER 17-20.—OKLAHOMA CITY, OKLA.
American Water Works Association—Southwest Section. (Biltmore Hotel.) Sec.-Treas., Lewis A. Quigley, 3320 W. Berry St., Fort Worth, Texas.

OCTOBER 17-21.—WASHINGTON, D. C.
Civil Service Assembly of the United States and Canada. Exec. Dir., G. Lyle Belsley, 1313 E. 60th St., Chicago, Ill.

OCTOBER 19-21.—CINCINNATI, OHIO.
National Association of Assessing Officers. (Hotel Gibson.) Exec. Dir., Albert W. Noonan, 1313 E. 60th St., Chicago, Ill.

OCTOBER 19-21.—ATLANTIC CITY, N. J.
Pennsylvania Water Works Association. (Haddon Hall.) Sec., Dr. F. Herbert Snow, 327 Telegraph Bldg., Harrisburg, Pa.

OCTOBER 21-22.—ASBURY PARK, N. J.
American Water Works Association—New Jersey Section. (Berkeley-Carteret Hotel.) Sec.-Treas., H. N. Lendall, College of Engineering, Rutgers Univ., New Brunswick, N. J.

OCTOBER 23-26.—NEW ORLEANS, LA.
National Association of Commercial Organization Secretaries. (Hotel Roosevelt.) Asst. Sec.-Treas., Mrs. Norma McKellops, 1615 H St., N. W., Washington, D. C.

OCTOBER 24-25.—IOLA, KANS.
Kansas Association of Municipal Utilities. Sec.-Treas., L. C. Angevine, McPherson, Kans.

OCTOBER 24-28.—DETROIT, MICH.
National Tax Association. (Hotel Statler.) Sec., W. G. Query, South Carolina Tax Commission, Columbia, S. C.

OCTOBER 25-28.—KANSAS CITY, MO.
American Public Health Association. Exec. Sec., Dr. Reginald M. Atwater, 50 W. 50th St., New York.

OCTOBER 26-29.—RIVERSIDE, CALIF.
American Water Works Association—California Section. (Mission Inn.) Sec.-Treas., Carl M. Hoskinson, Division of Water, Sacramento, Calif.

OCTOBER 26-28.—PORT ARTHUR, TEXAS.
League of Texas Municipalities. Exec. Sec., E. E. McAdams, 2220 Guadalupe St., Austin, Texas.

OCTOBER 31-NOVEMBER 2.—GREENSBORO, N. C.
Joint meeting. (King Cotton Hotel.) *American Water Works Association—North Carolina Section. North Carolina Sewage Works Association.* Acting Sec., A. R. Hollett, Chapel Hill, N. C.

NOVEMBER 7-9.—SAN ANTONIO, TEXAS.
Texas Public Health Association. (Gunter Hotel.) Sec., P. A. Kerby, State Board of Health, Austin, Texas.

NOVEMBER 14-19.—HAVANA, CUBA.
Pan American Congress of Municipalities. Congress. Address: Clifford W. Ham, Exec. Sec., American Municipal Association, 1313 E. 60th St., Chicago, Ill.

NOVEMBER 16-18.—DETROIT, MICH.
Michigan Municipal League. Acting Dir., Herbert A. Olson, 205 South State St., Ann Arbor, Mich.

NOVEMBER 17-18.—ATLANTIC CITY, N. J.
New Jersey State League of Municipalities. Exec. Sec., S. S. Kenworthy, 808 Trenton Trust Bldg., Trenton, N. J.

NOVEMBER 30-DECEMBER 2.—WASHINGTON, D. C.
Highway Research Board of the National Research Council. Dir., Roy W. Crum, 2101 Constitution Ave., Washington, D. C.

DECEMBER 1.—WASHINGTON, D. C.
American Federation of Housing Authorities. (Hays-Adams House.) Pres., Langdon W. Post, 346 Broadway, New York.

DECEMBER 5-9.—DALLAS, TEXAS.
American Association of State Highway Officials. Exec. Sec., W. C. Markham, 1220 National Press Bldg., Washington, D. C.

DECEMBER 5-9.—NEW YORK CITY.
American Society of Mechanical Engineers. Nat'l Sec., C. E. Davies, 29 W. 39th St., New York City.

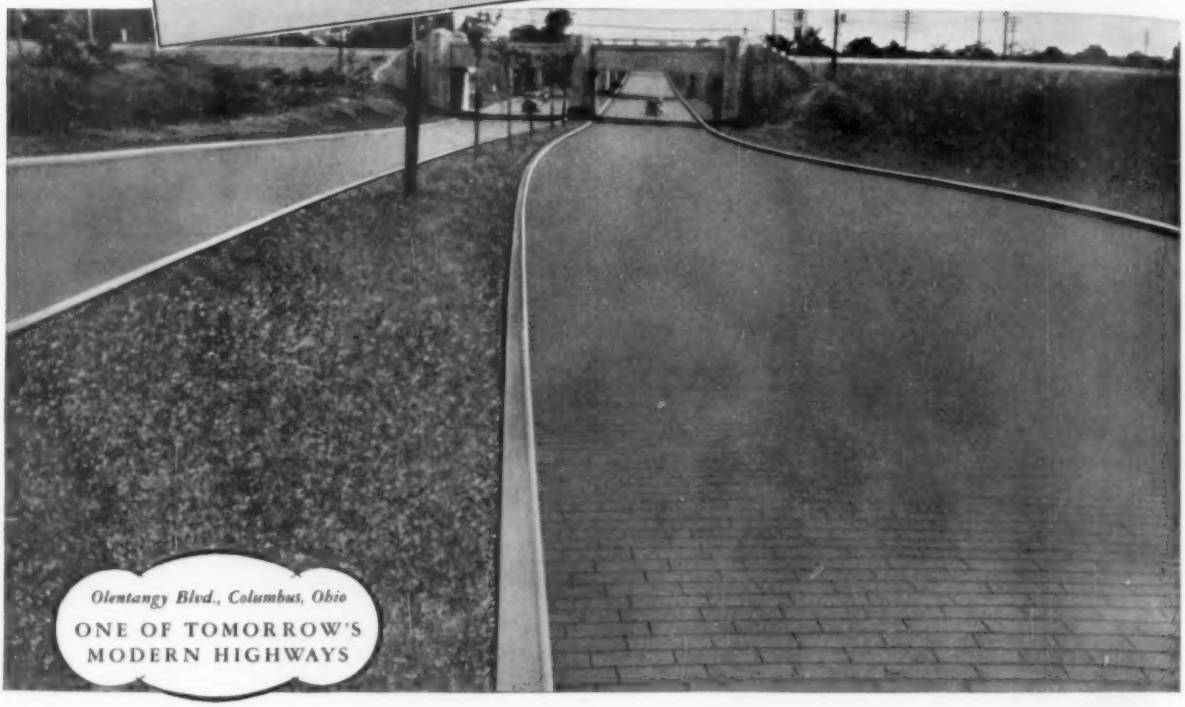
DECEMBER 8-11.—WASHINGTON, D. C. (TENTATIVE)
American Public Welfare Association. (Wardman Park Hotel.) Dir., Fred K. Hoehler, 1313 E. 60th St., Chicago, Ill.

DECEMBER 28-30.—DETROIT, MICH.
Tax Policy League. Exec. Sec., Dr. Mabel L. Walker, 309 E. 34th St., New York.

FEBRUARY 20-24, 1939.—LOS ANGELES, CALIF.
The Asphalt Institute. (Biltmore Hotel.) M'ng Dir., J. E. Pennybacker, 801 Second Ave., New York.

MARCH, 1939.—SAN FRANCISCO, CALIF. (Date later.)
American Road Builders' Association. Sec., Charles M. Upham, 952 Nat'l Press Bldg., Washington, D. C.

For Highways of Tomorrow



In the free-flowing express lanes of the Highways of Tomorrow, brick surfaced pavements will serve a vital purpose.

Divided traffic, limited access, elevated grades, tunnels and similar improvements will attract a heavier concentration of vehicles that cannot easily be detoured. The pavement must stay in service.

Brick pavements are immune to weather damage. They remain smooth and prevent destructive impact from cars and trucks.

From earliest records down to the present, Brick pavements have carried America's traffic at the lowest rate per mile—dependable always—a splendid surface for fast or slow-moving vehicles. National Paving Brick Association, National Press Building, Washington, D. C.

BRICK

THE BEST PAVEMENT FOR MODERN TRAFFIC

Do you mention THE AMERICAN CITY? Please do.

News and Illustrations

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

Interesting Development in Water-Works Field

The increased use of Activated Alum and Blackalum for water works is illustrated by the following statistics from Activated Alum Corporation, Curtis Bay, Baltimore, Md., on the sale of their alums in the water-works field.

During the month of June, 1938, this company manufactured and shipped 1,691,140 pounds of their alums to the industry. Of this, 1,477,800 pounds was Activated Alum and Blackalum, and 213,340 pounds was regular alum.

Rotary Snow Sweeper Shown in Catalog

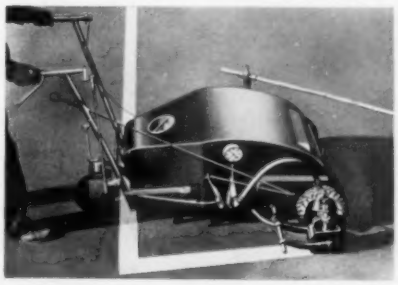
The Detroit Harvester Co., 5450 West Jefferson Avenue, Detroit, Mich., has just issued a new illustrated folder completely describing the Detroit sweeper and snow brush, which is small enough to go anywhere and powerful enough to sweep heavy accumulations of snow from sidewalks and bridges. It is also used successfully mounted on either a wheeled tractor or a truck for sweeping road surfaces prior to the application of bituminous prime or surface coats. Detroit Harvester sweepers are easily installed and attached. The original assembly may be made by any competent mechanic in a few hours, and then removal or reinstallation can be made in fifteen minutes, thus minimizing delay or tie-up of truck or tractor. The equipment is supplied with a simple manually powered lift control, or as optional equipment a hydraulic unit, either of which is easily accessible from the driver's seat.

New M-B Street Marker Helps Promote Safety

Modern traffic conditions present problems that deserve the serious consideration of highway engineers everywhere. Streets and highways abound with motor cars, trucks and buses traveling along at a fast speed. Pedestrians must be safeguarded. With the ever increasing traffic, well-marked streets are becoming a necessity.

Meili-Blumberg Corporation, New Holstein, Wis., is producing a new piece of equipment for traffic-line marking. It is a compact, self-propelling marking unit adaptable to all kinds of striping jobs—centerlines (single or double), diagonal or parallel parking, crosswalks, safety zones, etc. It is equally effective on all types of hard-surfaced road regardless of the usual irregularities encountered. Stripes of different widths can be made by simply changing the nozzle housing and brushes.

Only one man is required to mark or re-mark all streets, and he can do it in about one-fourth the usual time, according to the manufacturer. The operator easily controls painting, steering and speed of the marking unit, without lifting his hands off the handle bars. A single lever controls the flow of paint, the exact amount used depending on the speed of the operator and the kind of paint. Before paint is applied, the exhaust from the engine is blown directly in the path of the spraying unit. Paint is then sprayed onto the pavement and finished with a brush mounted behind the spray box. Thus the paint is evenly applied and the exhaust blower and combination spray and brush insure clean, well-defined lines with no drippings or splashed edges.



A MEILI-BLUMBERG STREET MARKER, SHOWING THE INGENIOUS ROAD AND CHAIN ARRANGEMENT USED AS A GUIDE FOR THE OPERATOR IN MARKING THE STREET

Any kind of paint or hot asphalt can be used. The pressure is controlled by an especially designed pump connection with a by-pass valve. The flow of paint is fully automatic. An economical ¾-hp engine both pumps paint and propels the machine forward.

A quickly attachable hand spray gun is available for various paint-spraying jobs such as gutters, park benches, poles, guard-rails, bridge abutments, fences, etc., thus increasing the marker's utility.

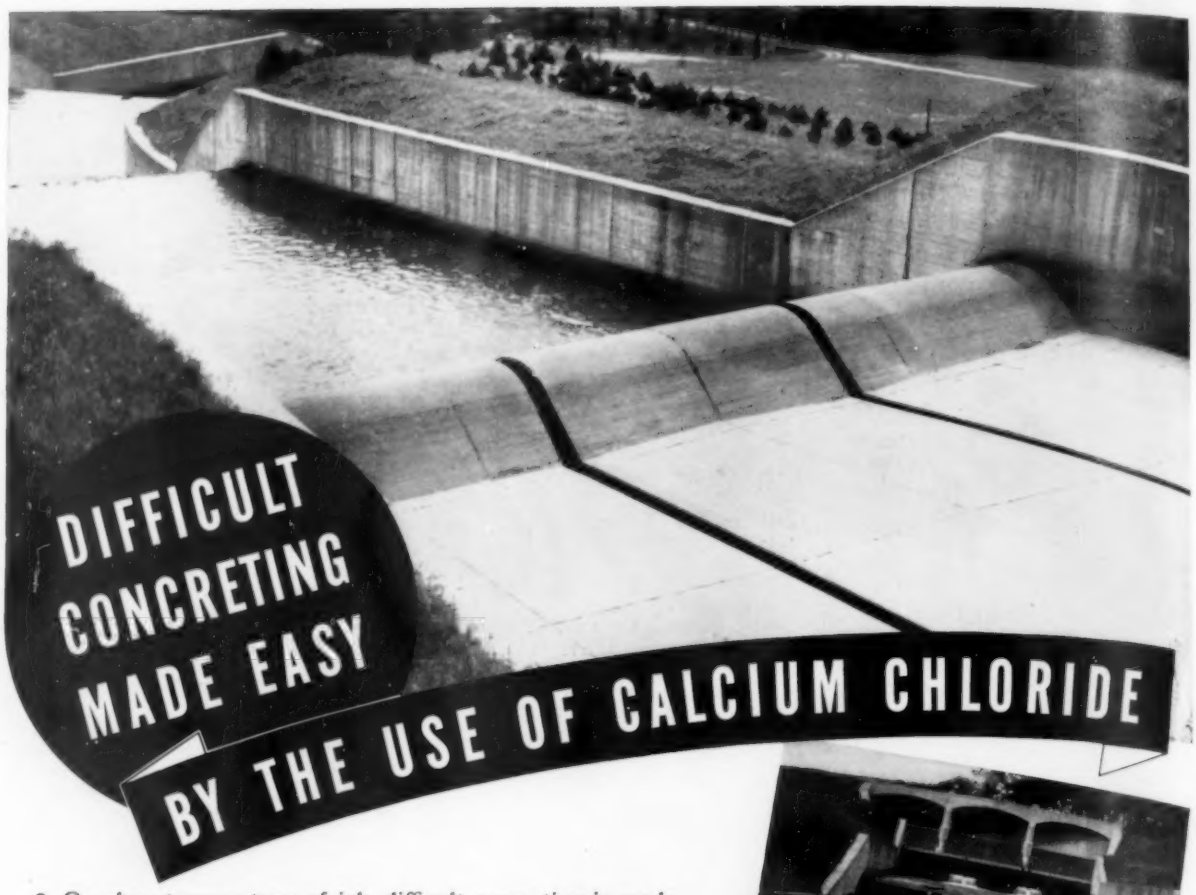
Canariis Joins Pomona Pump Company

Svend A. Canariis, formerly Water-Works Engineer for the Westinghouse Electric & Manufacturing Co., in East Pittsburgh, Pa., has been appointed Water-Works Engineer for the Pomona Pump Co., Pomona, Calif.

Mr. Canariis was born and educated in Denmark and came to this country in 1922, where his engineering training enabled him to secure successive connections with several power companies and municipal departments. Actively interested in the promotion of modern methods and equipment for water-works plants and systems, Mr. Canariis is recognized as one of the pioneers in this work. He has prepared numerous papers for the engineering associations and articles for the leading technical publications. He is a member of the American Water Works Association and the American Institute of Electrical Engineers.

In his new position Mr. Canariis will make his headquarters in Pittsburgh, Pa. His activities will, at the present, consist of special engineering in the eastern states and foreign countries.

A PARK AREA IN WASHINGTON, D. C., BEING GRADED FOR USE AS A PLAYGROUND BY A CATERPILLAR DIESEL RD-7 TRACTOR EQUIPPED WITH A BULLDOZER



DIFFICULT CONCRETING MADE EASY BY THE USE OF CALCIUM CHLORIDE

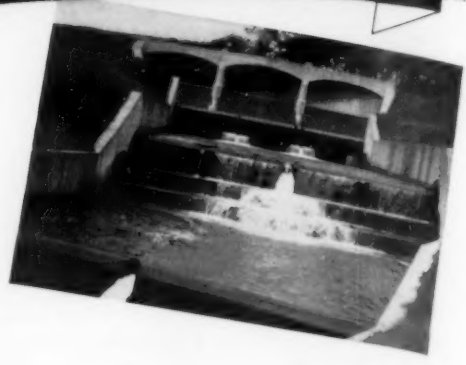
• On almost every type of job, difficult concreting is made easy and many money-saving advantages are gained by the construction official or contractor who uses calcium chloride in concrete. Acceleration of the rate of hardening, increased workability and flowability, savings in time, labor, forms, to name a few.

Take, for example, the reservoir of a municipal water company in an eastern state, pictured here. The spillways and sidewalls were placed in the late fall of 1929, using 2 lbs. of calcium chloride to every sack of cement. By use of calcium chloride, a minimum of formwork was required for the sidewalls, while the rounded spillway crests were placed without any forms whatsoever. Practically as soon as the concrete was placed, it was shaped and finished—an extremely difficult accomplishment without the increased workability and acceleration of set induced by calcium chloride.

In June of this year—9 years after construction—the project engineer describes the job as "one of the finest examples of concrete construction I have ever seen."

You can get the same results in your own concreting—whether it's paving or structural, a large job or a small one. And once you have given calcium chloride a trial, you'll place no concrete without it.

In addition to the other money-saving advantages obtained, technical authorities such as the National Bureau of Standards and Highway Research Board have established that a calcium chloride admixture produces stronger concrete, in faster time. Write today for complete literature on specifications and methods.



At top—The spillways and sidewalls of this reservoir were easily placed, through use of calcium chloride in the concrete. Photographed June, 1938—nine years after construction.

Bottom—Another view, showing part of the same reservoir. The engineer attributes the excellence of concrete to the use of calcium chloride admixture.

CALCIUM CHLORIDE ASSOCIATION
4145 PENOBSCOT BUILDING DETROIT, MICHIGAN

CALCIUM CHLORIDE
FOR MODERN CONCRETE CURING

THE NEWEST CRAWLER-MOUNTED MODEL OF THE NELSON SNOW LOADER

New Snow Loader Is Crawler Mounted

The N. P. Nelson Iron Works, Inc., Passaic, N. J., has announced improvements in its self-feeding snow loader, developed particularly for removing plowed windrows of snow from gutters and loading it rapidly into trucks running behind the machine.

Some of the outstanding features of the 1938 model are the new and improved ice-cutting spiral feeder, the saw teeth of which readily handle blocks of frozen snow, and the swivel belt discharge which permits side and end loading at any position through a 180-degree swing controlled from the operator's platform at the side of the machine. There are ten selective travel speeds ranging from 18 feet per minute to 3 miles per hour, which are very helpful in permitting the machine to operate in all kinds of snow. The loading capacity averages 10 cubic yards per minute. The elevator is raised or lowered by a fully enclosed power hoist controlled from the operator's platform.

New Nozzle for Fire Fighting

Spray Engineering Co., Central Street, Somerville, Mass., has just announced a new line of Fire-Fog nozzles for combating industrial oil fires, particularly in open containers, transformers, dip tanks and impregnating tanks. These nozzles use a water spray rather than special chemicals, and mark a radical change in the technique of fighting oil fires. In operation, it combines a blanketing and cooling effect in extinguishing the flames. The use of a water spray eliminates the cost of special chemicals and prevents the possibility of the supply's being exhausted before the fire is put out.

Spraco portable Fire-Fog equipment has been approved by the Factory Mutual Laboratories of the Associated Factory Mutual Fire Insurance Companies, after an exhaustive series of tests with water pressures from 30 to 160 pounds per square inch.

The nozzles may be used coupled directly to a hose or in conjunction with play pipes, which are furnished in several sizes. A new illustrated bulletin giving complete specifications can be obtained by writing to the Spray Engineering Co. direct and mentioning THE AMERICAN CITY. Ask for Bulletin No. 618.

Full Vision Gas Masks

The U. S. Bureau of Mines has recently officially approved Acme Full Vision Gas Masks Nos. 4 and 4A for organic vapors, made by the Acme Protection Equipment Co., Inc., 3623 Liberty Avenue, Pittsburgh, Pa. An outstanding feature of these new masks is the Full Vision safety glass lenses which permit the wearer to see as readily as when not wearing a mask. Another feature emphasized by the manufacturer is the dead air check-valves on the outlet ends of the fresh-air ducts. These valves automatically open and close upon inhalation and exhalation and prevent the accumulation of exhaled breath in the fresh air ducts. This mask is particularly adapted for use in sewer investigations and in parts of sewage-treatment plants where sewer gas is likely to be present.

A light-weight, all-rubber face piece, fully molded and cured to master face fitting proportions, provides comfort to the wearer. There are no rivets, threads or adhesive tape pads which might irritate the face, and the head harness buckles are incorporated in such a way as to eliminate uncomfortable pressure points on the wearer's face and forehead. This gas mask is very light in weight.

THE NEW ACME FULL VISION GAS MASK

The illustration shows the Acme Full Vision Gas Mask No. 4A, which is provided with a 27-inch flexible hose and carrier. The No. 4 mask is of the front-lace carrier type with a 10-inch flexible corrugated hose. Copies of Folder M387, describing these masks in detail, may be secured by writing to the manufacturer direct and mentioning this magazine.

Pittsburgh Parking Meter

The Pittsburgh Taximeter Co., Point Building, Pittsburgh, Pa., which for more than 25 years has designed and manufactured taximeters and truck recorders, has now produced a parking meter. The meter purposely does not show the unexpired time.

The meter is automatic, with the requirement that the signal must be pulled down to open the coin slot, which is closed as a protection against dust, rain, snow and ice. Pulling down the signal automatically winds the clock. This signal can be seen at a great distance from any angle and can be easily inspected by the patrolman. The center of the signal contains a bright-red disk carrying the seal of the municipality operating the meters.

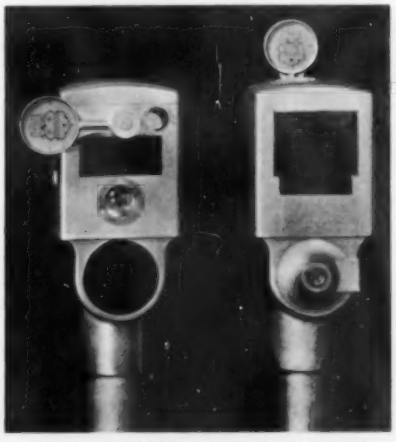
The detection of the use of slugs is simplified by means of a magnifying glass window showing the last coin deposited in the meter. The coin-box is enclosed in a theft-proof miniature safe.

Rubber Plays Role of Modern Traffic Cop

An important contribution to intelligent traffic regulation is the modern automatic vehicle detector which permits the regulation of stop lights according to the flow of traffic. Installed flush with the pavement on either side of the road approaching the light, these detectors register the passage of oncoming cars in relation to volume.

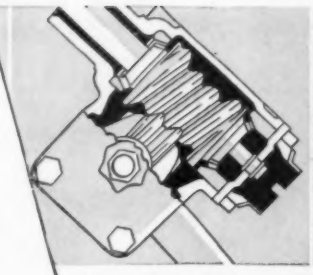
The unit is known as the Electro-Matic Pressure Sensitive Vehicle Detector and was developed by the Automatic Signal Corporation of East Norwalk, Conn. It is simple in construction, consisting of a steel base casting with a splice-box located at one end and a contact unit. The contact unit consists of a molded rubber slab attached to a metal base plate. The slab has a groove running the full length of its underside, in which a steel plate is inserted. Operating on the open circuit principle, electrical contact is made by a car passing over the rubber slab and compressing it to a point where the steel insert on its underside touches the base plate. As soon as the pressure is relieved, the resilient rubber springs back to its original position and breaks the circuit.

Finding a rubber which would measure up to the requirements for this service was the problem of the engineers of The B. F. Goodrich Co., Akron, Ohio, who not only produced a rubber compound offering the necessary resistance to abrasion and the oxidizing rays of the sun, but provided a method, known as the Vulcalock process, by which the rubber could be permanently adhered to the metal base plate. Hundreds of these Electro-Matic Vehicle Detectors are in use today both here and abroad.



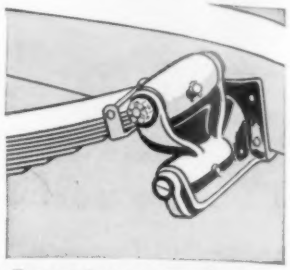
THE NEW PARKING METER BUILT BY PITTSBURGH TAXIMETER

A FORD TRUCK IS GREATER THAN THE SUM OF ITS PARTS



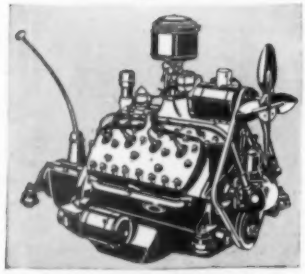
For easier driving and parking—worm and roller type steering.

Full-floating rear axle relieves the axle shafts of supporting the weight of chassis and body.



Rear springs are free-shackled at both ends. An earmark of top-quality truck construction.

—BUT LOOK AT SOME OF ITS PARTS!

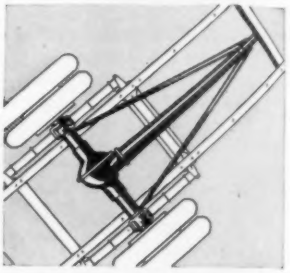


V-type 8-cylinder engine—still rolling up records for performance and economy.

Some truck buyers like to go over a unit part by part, and judge it on "points." A few of the features of the 1938 Ford V-8 Truck are shown here. Some are interesting because they are new improvements. Some are time-proved features which continue to be newsworthy because they represent the type of expensive design and construction which Ford is able to offer at low cost.

But—a Ford Truck is *greater* than the sum of all its parts. *Into* each truck goes the experience gained in 21 years of truck-building leadership. *Back* of each truck is the constant Ford ideal—to build strong, *lightweight* trucks that put MORE PAY IN EVERY PAYLOAD. And *with* each truck go the time-and-money-saving advantages of the Ford Engine and Parts Exchange Plan.

You get value *far beyond* its price when you get a Ford V-8.

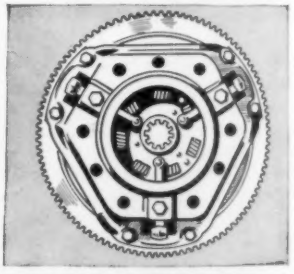


Full torque-tube drive relieves springs of driving and braking stresses.

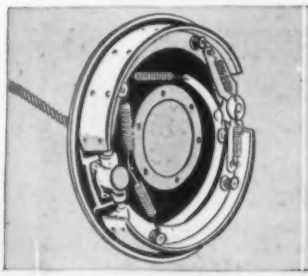
New welded all-steel cab gives extra strength, safety, comfort. 3 inches more head room.

FORD V·8

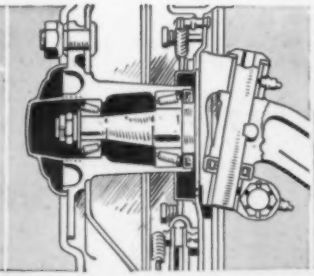
TRUCKS AND COMMERCIAL CARS



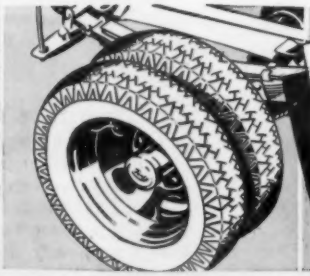
Centri-force Clutch. One of the most efficient, most reliable truck clutches ever built.



New bigger brakes—less pedal pressure—safety of steel from pedal to wheel.

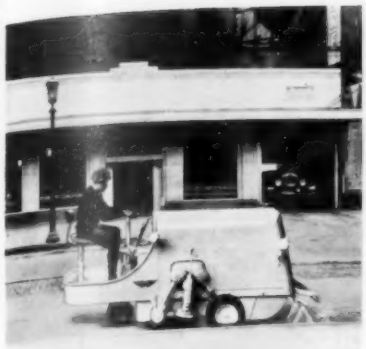


Larger spindles equipped with larger spindle bolts increase the safety factor.



7.50-20 dual tire and wheel equipment is now available at slight extra cost.

ARRANGE FOR AN "ON-THE-JOB" TEST



THE NEW BYERS WHITE WING PICK-UP POWER SWEEPER

Byers Announces Sweeper of Small, Compact Size

A recent survey among 200 city officials in the United States of the cost of sweeping city streets by power pick-up sweepers indicated a need for a small, compact, low-cost power sweeper, which has now been announced by The Byers Machine Co., Ravenna, Ohio.

This sweeper, the "Byers White Wing," sweeps slightly more than a 4-foot width of street next to the curbing at an average operating cost of 4 cents per curb mile plus operator's wages. It uses less than 5 gallons of gas, a cupful of oil and 3 ounces of grease to sweep 20 curb miles per day at a sweeping speed of 4.8 miles per hour. Thus low purchase, operating and maintenance costs bring power sweeping methods within reach of small municipalities.

The wire gutter broom scours hard-packed dirt out of the gutter, throwing it in the path of the main broom. The main pick-up broom throws litter forward, directly into the half-cubic-yard hopper without use of conveyor belts or drag elevators. Control of brush speeds is independent of travel speeds to provide maximum flexibility for picking up every kind of litter.

The sweeper is equipped with battery, electric starter, headlights, gutter spot and tail lights for night operation, plus other usual accessories. From a 60-gallon tank, a fine spray of water is laid in front of the machine to dampen dust.

Simplified straight-line flow of power from a 15-hp motor, through disc clutch and one transmission, delivers ample power to the main brush, gutter broom, travel and water pump.

Complete catalog description of the Byers White Wing may be secured by writing direct to The Byers Machine Co. or to THE AMERICAN CITY.

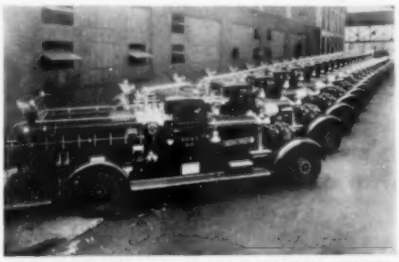
Latest Apparatus for Fire Service

Series H & I, most recent equipment of The Ahrens-Fox Fire Engine Co., Cincinnati, Ohio, includes apparatus of 1,000 gpm capacity (Series H) and 750 capacity (Series I). They are designed for universal service under the conditions prevailing in the majority of cities, towns and fire districts, and are provided in combination pumping engines, ladder apparatus, hose cars and special-duty units of all kinds.

As pioneer motor fire-engine builders, this organization has developed many innovations which are now accepted as standards of fire-fighting technique and apparatus design. Being makers of motors and pumps, and builders of component automotive parts especially designed for the particular requirements of fire department equipment, Ahrens-Fox produces real fire apparatus units which give dependable service.

The motor used in apparatus of the H & I series combines extreme simplicity, a minimum of parts, economy, and extraordinary power at moderate rotative and piston speeds. Ignition is by two separate systems—magneto and battery—with dual spark plugs.

The fire pumps furnished are either the Twin-Triple piston or two-stage series-parallel centrifugal types, with pump pressure ratings up to 600 pounds. Twenty-two Model H pumping engines recently delivered to the city of New York and the New York World's Fair were equipped with Twin-Triple piston type pumps capable of developing 600 pounds net pump pressure.



THE TWENTY 1,000-GALLON PISTON PUMPERS RECENTLY DELIVERED BY AHRENS-FOX FIRE ENGINE CO. TO THE CITY OF NEW YORK

Heil Equips More Units for New York Garbage

A fleet of more than 200 trucks equipped with fully enclosed, automatic-loading Heil garbage-collecting bodies manufactured by The Heil Co., 3000 West Montana Street, Milwaukee, Wis., has recently been delivered to the city of New York. This is the second time within three years that The Heil Co. has secured a large order for this type of equipment from the New York Sanitation Department.

The dump units shown in the illustration are outside the Training School of the Department of Sanitation in New York City. In this school men are trained to operate the telescopic hoist which elevates the body to discharge the load, the endless conveyor which propels the load from the receiving hopper into the body, and the snow-plows for clearing the streets.

Rubbish is loaded into the receiving hopper at the rear of the body and is carried by an endless chain conveyor up into the body. An overload clutch stops the conveyor in case of an obstruction. To dump the contents of the body, hydraulically operated jacks raise the tailgate, and the Heil twin cylinder telescopic hoist elevates the body to a 55-degree angle. In addition to the loading conveyor, the bodies are equipped with side loading doors near the front. All controls for operating the hoist, conveyor, tailgate and snow-plow are located in the cab.

The bodies are specially designed units of 22-cubic-yard capacity, almost 18 feet long and 8 feet wide. The gross weight of the vehicle is 37,000 pounds, and between 65 and 70 per cent of the weight is carried on the rear wheels. The Model UT Autocar which propels the unit has a 173-inch wheelbase, and is equipped with air brakes and 11.25 x 20 dual rear tires.

Repeat Hydrant Orders

The Western Gas Division, Koppers Company, Fort Wayne, Ind., has received a new contract from the city of Chicago, Ill., for 2,000 fire hydrants to cost approximately $90,000. This is the third order to be received this year by Koppers Company for Chicago public works equipment.

FOUR OF THE FLEET OF LARGE-CAPACITY DUMP UNITS RECENTLY DELIVERED BY THE HEIL CO. TO THE NEW YORK DEPARTMENT OF SANITATION

The RIGHT START toward lasting duct ECONOMY

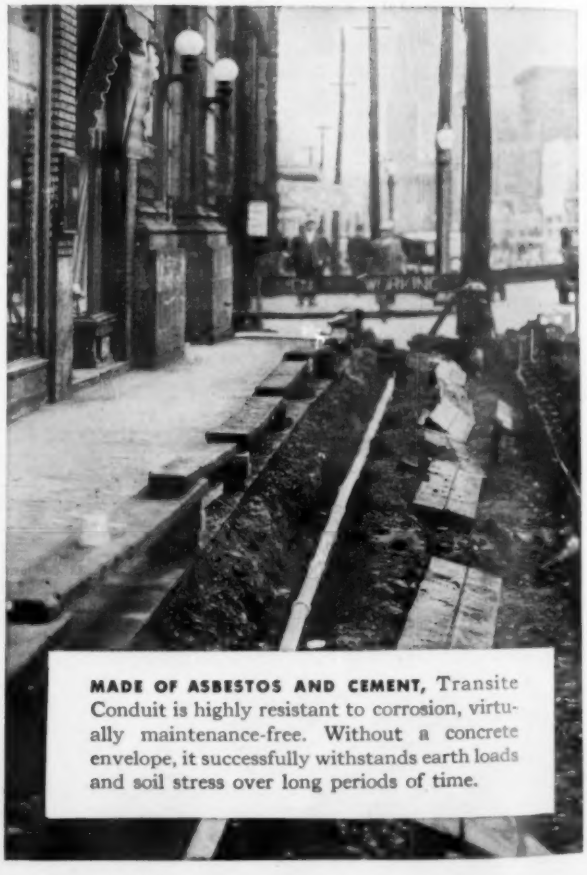
NO CONCRETE CASING was required on this Transite Conduit traffic-signal system. As a result, installation was completed rapidly . . . and costs were considerably reduced.

Non-metallic, inorganic, J-M Transite Conduit's enduring strength eliminates need for "concreting-in". . . provides virtual freedom from maintenance

YOU don't have to pay for concrete or expensive metallic ducts when you install J-M Transite Conduit. For this duct is so strong it needs no protective encasement underground. And that means worth-while savings in time, labor and materials right at installation.

The unusual strength that makes these savings possible is easily explained. Transite Conduit, made of a tough composition of asbestos and cement, *is non-metallic* and *inorganic* . . . highly resistant to soil corrosion . . . immune to electrolysis . . . retains its full strength and true form under sustained loads. In fact, Transite Conduit actually increases in strength through the years . . . and its great durability keeps maintenance and operating costs exceptionally low.

On hundreds of signal, communication, transmission and distribution systems, J-M Transite Conduit has proved itself more economical to install . . . less expensive to maintain. For complete information, write to Johns-Manville, 22 East 40th Street, New York City.



MADE OF ASBESTOS AND CEMENT, Transite Conduit is highly resistant to corrosion, virtually maintenance-free. Without a concrete envelope, it successfully withstands earth loads and soil stress over long periods of time.

Johns-Manville
TRANSITE ELECTRICAL CONDUIT

Water Level and Flow Records Telemetered

Almost any type of records which are capable of being reproduced on a gage can be transferred long distances over electric wires by means of the telemetering instruments made by The Bristol Co., Waterbury, Conn. Pressure and vacuum, water level, the flow of liquids, voltages, temperatures and many other important records are easily and accurately transmitted.

This instrument is widely used by water companies for recording in the pumping station the water level in remote reservoirs and elevated tanks. It provides the operator with instantaneous information regarding water level miles away.

Bulletin No. 515 issued by The Bristol Co. describes the Bristol Metameter in detail. The Metameter is simple in construction, consisting only of two small self-contained instruments, the transmitter and the receiver, weighing less than 40 pounds. A simple two-wire transmission circuit is employed between the transmitter and the receiver, and private wires and telephone circuits may be used for this transmission circuit. The readings may be transmitted by means of carrier current. The accuracy of the system is not influenced by circuit characteristics. The readings are transmitted as a function of time, and electricity is supplied to the circuit merely to provide power for the electrical impulses and to operate the transmitting and receiving mechanisms. Variations in voltage do not affect the accuracy of the readings.

Municipal Bookkeeping Machine

An All-Purpose typewriting-bookkeeping machine is described in a folder by National Cash Register Co., Dayton, Ohio, combining standard typewriter and adding machine keyboards, two daters, wide carriage, full visibility, removable stop bars for different kinds of jobs, and suitable for payroll preparation, vendor's ledgers, check writing and stock records.

Powerful Speaker Protects Bathers

A powerful sound amplification system utilizing a new type of loudspeaker has been installed on the beach at Atlantic City, N. J., to police the bathing areas, direct life-saving operations, and locate straying children. Engineers of the RCA Mfg. Co., Camden, N. J., have set up the system at the central beach patrol station.

Newly developed 60-watt loudspeakers have been mounted atop beach tents on swivels so that they can be turned in any direction to cover the beach for distances exceeding a half-mile north and south of the station or offshore. The amplifiers and microphones are installed in the beach tents. The loudspeaker was recently perfected by RCA engineers for outdoor applications. It can be made to direct sound on a beam for great distances with remarkable clarity, and is completely weatherproof and resistant to salt air corrosion.

The system as installed at Atlantic City is frequently used to warn bathers who venture too far into the sea, and to make other announcements. Phonograph records are also played through the system for the entertainment of crowds on the beach. Since the RCA sound system was installed, early in the season, many lost children have been located and returned to their worried parents by announcements over the system. The average of children located is between two and three a day.

UNDERWATER FLOODLIGHT FOR FOUNTAINS

Underwater Floodlights

Floodlights, for use in the fresh water of fountains, pools and waterfalls, have been designed by the Lighting Division of the Westinghouse Electric & Manufacturing Co., of Cleveland, Ohio, and designated Westinghouse Type CF-10 Aqualux.

A special thermo-pressure treatment is used to eliminate water seeping into the unit, making a watertight unit which requires neither draining nor ventilation. The aluminum reflector stands high temperature, cannot crack, chip or peel, and is easily cleaned.

Rotary Snow-Plow Loads City Trucks

A new snow-removal unit which combines the speed of the blade-type plow and the effective snow-removing qualities of a rotary-type plow, and which in addition has a hydraulic-controlled loading chute for trucks when used in city streets, has been developed and was first put into operation last winter by the Snow Removal Equipment Co., 400 Seventh Street, San Francisco, Calif. This unit, which can be mounted on or detached quickly and easily from any make of truck, can be used for removing snow from a highway or street in one operation or can be used in combination with blade plows in open country by following and removing the snow from the highway as it is pushed to the side by the blade. It can be used to throw snow 50 feet from a road in open country.

The unit consists of a 3/16-inch high carbon steel moldboard, 42 inches high and 8 feet long, reinforced at the top and bottom and ribbed vertically on the back, at the outer end of which is a rotor. The rotor is 42 inches in diameter, with 6 blades 12 inches wide. The rotor shaft is of $2\frac{3}{4}$-inch special nickel steel for safety at low temperatures. Connected to the rotor is a chute through which the snow is passed and thrown from the highway or by a simple hydraulic shift is moved to throw the snow down into a truck alongside.

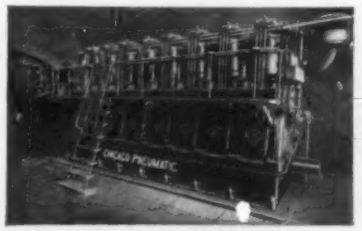
Power for the rotor is furnished by a Ford V-8 truck engine, equipped with a McCulloch Supercharger developing 110 hp complete with an electric starter controlled from the truck's cab. The engine is set at the left side and is built into the main plow frame. A standard Ford truck transmission and clutch are used. Special heavy-duty gears replace the Ford transmission gears and furnish two speeds on the rotor. These gears are interchangeable with the standard Ford gears. The drive shaft is mounted on two S.K.F. ball bearings and connected with the universal joint. Two strands of double 1-inch pitch roller chains are used from the drive shaft to the jack shaft and from the jack shaft to the rotor shaft. The entire transmission is housed and runs in an oil bath.

The plow is attached to the truck by a special pivot axle device, the patent for which has been applied for. Either end of the blade may be elevated 8 inches without placing undue strain on the truck frame or the springs; the entire thrust is taken in the truck channel frame. Blackhawk remote control lifts the blade.

Literature describing this Rotoblade and showing it in use may be secured direct from the manufacturer by mentioning THE AMERICAN CITY.

New Bulletin Issued on Diesel Engines

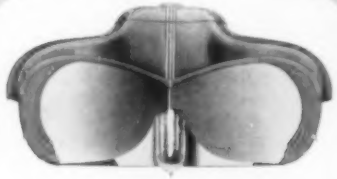
The Chicago Pneumatic Tool Co., 6 East 44th Street, New York, has recently issued Bulletin 769 which describes in great detail the type RHB-100 CP diesel engine for stationary services requiring horsepower output from 300 to 800. These engines are four-cycle solid-injection units, designed especially for heavy-duty, continuous or automatic service, and have an unusually effective cylinder-head design, rugged base construction, accessible frame parts, effective balancing of the rotating units, and sensitive control.



THE C-P DIESEL ENGINES FOR MUNICIPAL SERVICE

CALIFORNIA MATCHES VISIBILITY AGAINST SPEED *On Bayshore Highway!*

Westinghouse Highway Luminaires on a section of the Bayshore Highway. Even under the most adverse conditions (when pavement is wet as shown in the photograph), adequate visibility for drivers is provided.



Fifty-five Westinghouse Highway Luminaires (burning 10,000-lumen sodium-vapor lamps in a vertical position) are installed on one section of the Highway.

Thirty-five Westinghouse Reflectolux Sr. Luminaires (enclosed units burning 10,000-lumen sodium lamps) are installed on another section of the highway.

WESTINGHOUSE SODIUM LUMINAIRES INSTALLED TO REDUCE NIGHT DEATHS

Eighty-two per cent of all traffic deaths on the San Francisco Bayshore Highway occurred at night when only 25% of the traffic was on the highway.

After many safety efforts had proved ineffective, the Division of Highways of the State of California installed modernly designed sodium-vapor highway luminaires in the hope of matching visibility for the automobile driver against speed and other hazards of the heavily traveled highway.

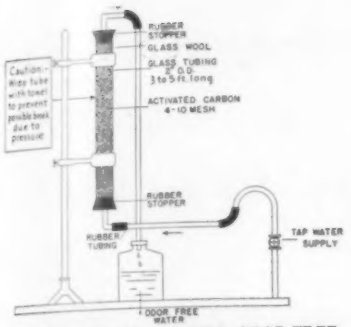
More than a hundred luminaires are now mounted along the most hazardous stretch of this highway . . . where the accident rate has been highest and where heavy fogs are frequent. The sodium lighting units flood the roadway with a mellow golden-yellow light which allows automobile drivers to see approaching dangers or unusual road hazards far enough ahead to avoid them in either dry or wet weather.

The Westinghouse Sodium Highway Luminaire, one of the three types installed on the Bayshore Highway, is constructed for either 6,000- or 10,000-lumen sodium-vapor lamps mounted vertically. This unit is designed to direct a large portion of the monochromatic sodium light on the road surface.

For complete details on the Sodium-Vapor Luminaire and the Westinghouse Reflectolux line of street and highway lighting units, call your local Westinghouse Lighting Specialist or address Westinghouse Electric & Manufacturing Company, Lighting Division, Edgewater Park, Cleveland, Ohio.

WHEN YOU THINK OF *Lighting Equipment* THINK OF

Westinghouse



APPARATUS FOR MAKING ODOR-FREE WATER

Method for Measuring Taste and Odor in Water

Operators of all water works will be particularly interested in the new laboratory or office card which the Industrial Chemical Sales Division, West Virginia Pulp and Paper Co., 230 Park Avenue, New York, has prepared for hanging in the laboratory, giving a simple method for measuring tastes and odors in raw and tap water. The card lists the apparatus required, on one side, with a very helpful and convenient conversion table, and the reverse of the card shows the exact procedure for determining tastes and odors, with illustrations. A dilution chart and a threshold number table with examples to show their use appear on this side of the card.

The accompanying illustration shows the set-up of apparatus for the production of the odor-free water which is necessary where making the dilutions in the threshold test. Copies of this card may be secured gratis by any water-works operators or officials by writing direct to Industrial Chemical Sales Division and mentioning THE AMERICAN CITY.

Water Ballast Rollers Added to Hercules Line

The Hercules Company announces an addition to its line of variable weight rollers of the three-wheeled type.

One of these new models—the 7- to 8-ton size—is illustrated herewith. Its weight with empty rolls is approximately 14,000 pounds, and with the rolls filled with water slightly over 16,000 pounds. In addition, the two large tanks mounted on the side of the roller frame will carry an additional 100 gallons, increasing the total weight still further to the amount of 800 pounds. Other than the special water-ballasted front and rear rolls, there are no changes in the basic design.

The Hercules Company believes a variable weight three-wheel roller lends itself to a wider range of application without materially increasing the investment. Further details may be obtained from this publication or from The Hercules Company, at Marion, Ohio.

THE 7- TO 8-TON SIZE THREE-WHEEL ROLLER WHICH THE HERCULES CO. NOW PRODUCES WITH WATER-BALLASTED FRONT AND REAR ROLLS

New Diesel Auto Patrol for All Road Jobs

A heavy-duty, self-propelled road grader, the diesel No. 12 Auto Patrol, has been announced by Caterpillar Tractor Co., Peoria, Ill. Designed for efficient and economical road building as well as road maintenance work, the new machine has a wide range of useful blade positions. In addition to high or low bank-cutting positions, the blade can be turned completely around on the full-revolving circle. With ample clearance both front and rear, the blade is thus positioned for working in reverse gear. This feature will be valuable for shaping bad spots and working short stretches or where turning is difficult. With the blade mounted in the center position on the blade beams, the new Auto Patrol permits a correct ditching position on either side.

A six-cylinder Caterpillar diesel engine delivers 66 brake horsepower, and is mounted over the driving axle to best utilize its weight in preventing wheel slippage. A gasoline starting engine insures easy starting regardless of atmospheric temperatures.

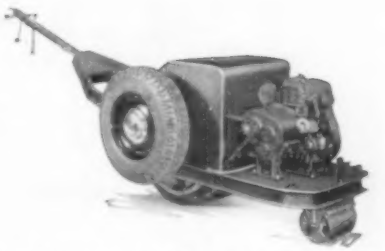
The transmission offers six forward speeds and two reverse. A low speed of 1.8 mph provides maximum pull for the heaviest jobs, and slow speed for fine grading. Second speed is 2.8 mph, permitting faster operation on most ditching and other heavy work. Four higher speeds of 4.3, 6.8, 9.6, and 15.2 mph give ample speed range for road mix, snow removal, travel, etc. Reverse speeds are 2.4 and 3.8 mph.

The diesel No. 12 Auto Patrol is equipped with two-speed mechanical power controls. A simple shift of a lever in the gear-box gives faster control for the longer blade movements on coarse work. For close finishing work, the slower control is quickly available.

The new Auto Patrol is offered with tandem drive and leaning front wheels as standard equipment.

Surface Heater Co. Opens New York Office

The Equitable Asphalt Maintenance Co., Inc., Kansas City, Mo., manufacturer of asphalt surface heaters, has announced the opening of an office at 470 West 24th Street, New York, with Clark Moore, Manager and Secretary of the company, in charge. The activities of this company on the eastern seaboard will be managed from this office. At the present time the Equitable Asphalt Maintenance Co. has a large contract with the boroughs of Manhattan and Brooklyn of New York City.



THE LITTLEFORD MODEL 150 MOTORIZED WHEELED ROLLER

New Wheeled Rollers Have Wide Distribution

The proof of the popularity of the Model 150 motorized portable wheeled rollers newly added to the Littleford line, and recently described in these pages, is easily found in the deluge of orders received during the past few weeks. Littleford Brothers, 443-457 East Pearl Street, Cincinnati, Ohio, report that shipments are going to all parts of the country and even to points beyond the United States' borders.

Among recent sales were three shipped to cities, five to State Highway Departments, one to a County Highway Department, one to a foreign government, two to contractors and one to a dealer.

Transformers on Line to Sewage Works

Recently three new Allis-Chalmers transformers were installed for the city of Columbus, Ohio, at the west end of its municipal light plant, on Dublin Avenue. The accompanying illustration shows the new equipment being inspected by (left to right) B. F. Thorton, Chief Electrician for the city of Columbus, Mayor Myron B. Gessaman, Llewelyn Lewis, Director of Public Service, and Robert N. Tucker, Superintendent, Division of Electricity.

The three Allis-Chalmers transformers, made by the Allis-Chalmers Mfg. Co., Milwaukee, Wis., each rated at 1,667 kva, take electricity at 6,900 volts for transmission to the city's sewage-treatment plant. In an appropriate ceremony recently, Mayor Gessaman operated the switch which closed the circuit to the transformers, starting the new transmission line service.

INSPECTING THREE NEW 1,667-KVA TRANSFORMERS AT THE COLUMBUS, OHIO, MUNICIPAL LIGHT PLANT

60 MILES *that tell a Graphic Story of* HOLOPHANE *Refractor Lighting!*

WHITE HORSE PIKE—from Camden to Atlantic City

BEFORE

AFTER

Both photographs were taken at the same spot on the White Horse Pike.

Hats off to the State of New Jersey in the movement to provide modern lighting over long stretches of road. The newest installation is the White Horse Pike from Camden to Atlantic City.

Holophane Refractors are used extensively for New Jersey's many miles of Highway Lighting. Efficient, Effective and Economical—Refractors provide an *extra* service by distributing the illumination properly, thus increasing vision.

Refractors will improve your street lighting system, too. Find out how Holophane Lighting decreases accident and increases safety by removing hazard. Write for full data today!

ILLUMINATION Consult Holophane Engineering Service SINCE 1898

HOLOPHANE CO., INC.

342 MADISON AVE., NEW YORK CITY TORONTO: 385 Yonge Street

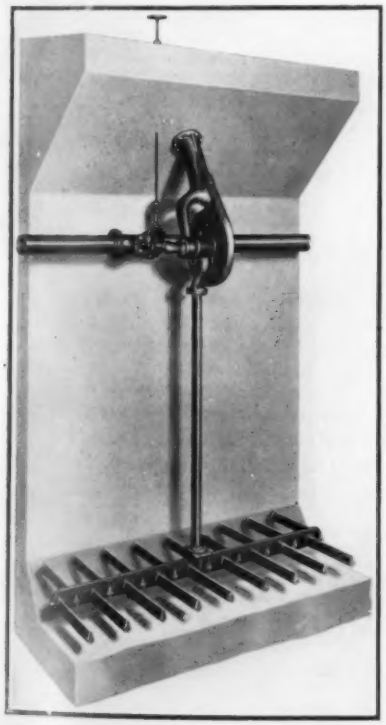
New Air Diffuser Easily Removable

Diffused air equipment for activated sludge treatment that can be raised out of the aeration tank without interrupting operation or dewatering the tank has been announced in a new bulletin issued by the Sewage Equipment Division of the Chicago Pump Co., 2319 Wolfram Street, Chicago, Ill. This new equipment is called the Swing Diffuser and is composed of an assembly of streamlined diffuser tubes suspended from a swing joint. The tube assembly can be raised to the tank walk by a portable electric hoist.

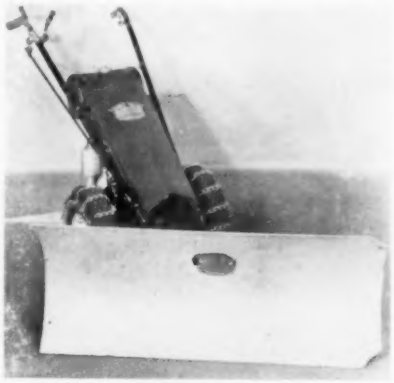
The accessibility of the diffuser tubes from the tank walk makes it a simple matter to space the tubes to regulate the air supply in accordance with the tapered aeration principle, giving controlled aeration for the activated sludge process.

Power economy is secured in the use of these diffusers because the aeration period may be reduced and less air is used with tapered aeration. The higher aeration efficiency of these units requires less air for optimum tank circulation and oxygenation. The porosity of the aeration tubes is continued as in their new condition very easily. The suspension of the diffuser tubes lessens the hydrostatic head and the air used for aeration.

The manufacturers state that the economy in air and the flexible characteristics of Swing Diffusers make it economically feasible for cities smaller than 10,000 population to obtain the advantages of diffused air in activated sludge plants operating on the tapered aeration principle. This is of special importance to the smaller cities having abnormal sewage strengths, including industrial wastes. In these cases the relatively great quantities of oxygen required for a proper aeration period can be supplied by Swing Diffusers and provide economical operation.



ASSEMBLY OF THE NEW SWING DIFFUSER FOR ACTIVATED SLUDGE TREATMENT OF SEWAGE



THE GRAVELY ONE-WAY SNOW-PLOW

Sidewalk Snow-Plows on Hand Tractors

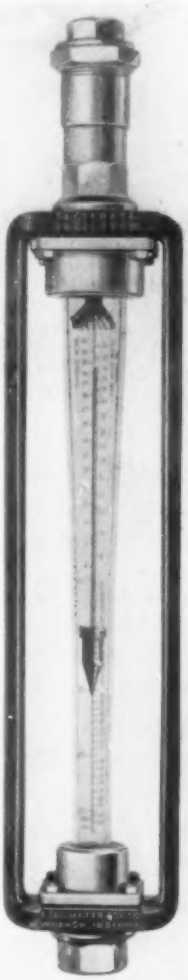
The difficult and expensive problem of removing snow from sidewalks and pathways during the winter months is made simple by merely using a sidewalk snowplow attachment on a 5-hp 4-cycle engine-powered Model L Gravely tractor, made by the Gravely Motor Plow & Cultivator Co., Dunbar, W. Va. The Gravely adjustable V-type plow clears a path from 40 to 54 inches wide, and it can be taken in and out of places where a larger machine could not possibly operate.

The patented reversible blade type plow is for use where it is necessary to take several swaths to clear the desired path or where you wish to start snowplowing away from buildings. With this plow it is possible to start right up against the edge of the building and keep the snow moving one way in a corkscrew manner. The plow is 4 feet wide and 2 feet high, and the curvature of the blade is designed for rolling the snow.

Rates of Flows Measured for Meter Testing

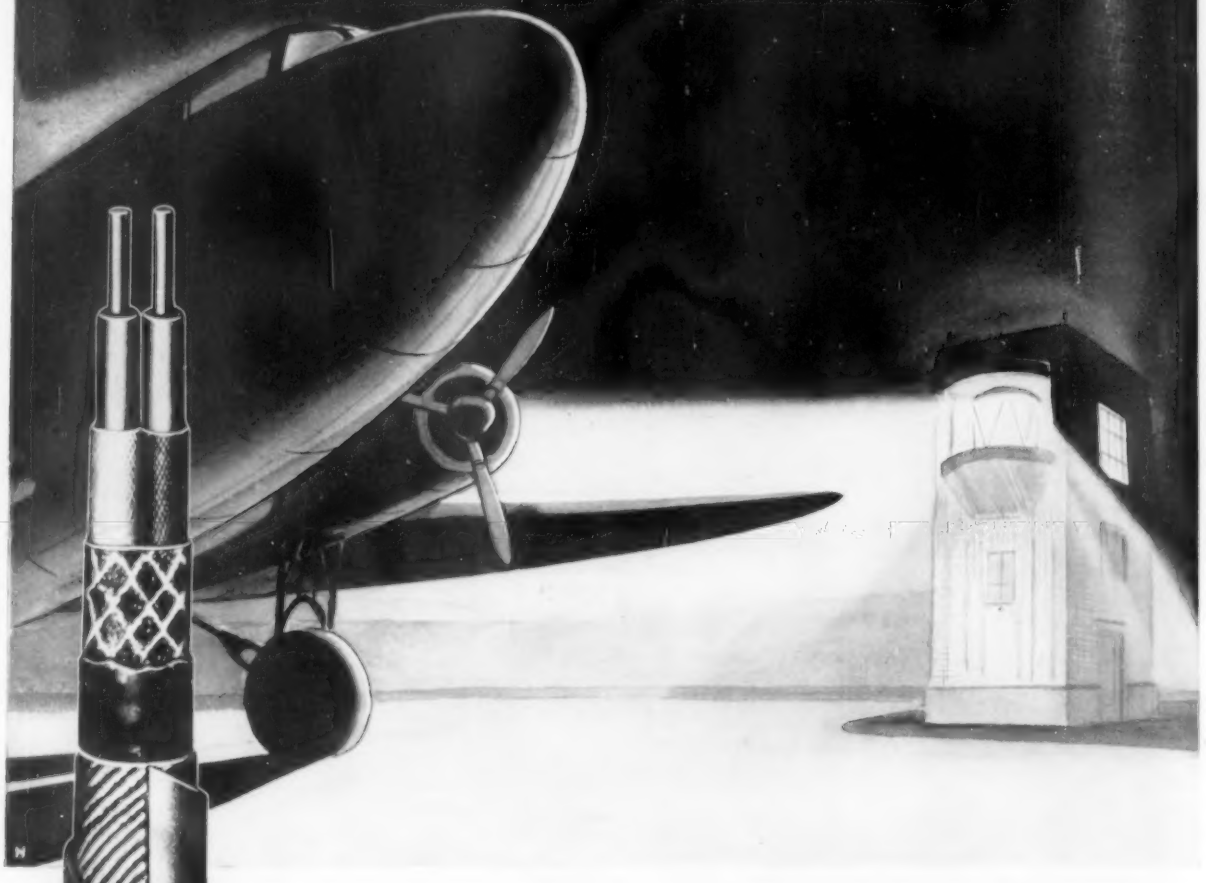
It is most important for water-works superintendents to be able to measure the low rates of flows through meters accurately. Most of the difference between good and bad ⅝-inch domestic meters lies in the way they perform at rates below one gallon per minute. Many poor and worn meters fail to register at all on rates of ½ gpm, under-register considerably on rates up to 1 gpm, and still perform within allowable limits at high rates. To replace the orifice or flow valve frequently used in the past to regulate test flows for meters, the Ford Meter Box Co., Wabash, Ind., has developed the Testerate Indicator which accurately measures flows from 0.05 to 30 gpm. This device consists of a tapered glass tube in which a stainless steel rotor is free to move up and down. The glass tube is held in a strong frame which is connected to the discharge piping of the tester above the valve used for adjusting the rate of flow.

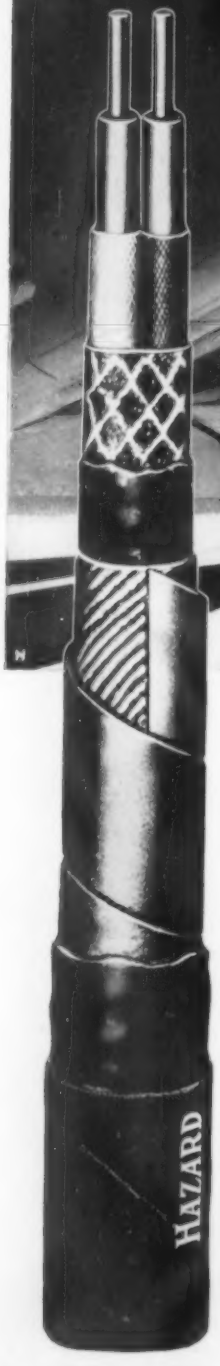
When water flows up through the tapered glass tube, the steel rotor rises until it reaches a position where the space between the tube and the rotor permits the passage of the flow. There the rotor is supported steadily on the rising stream, rotating freely and in contact only with the water. The exact rate of flow is read from the figure on the tube even with the top of the rotor. When the flow is increased, the rotor rises until the space between it and the tapered tube is enough larger to accommodate the greater flow. When the flow is decreased, the rotor assumes a lower position where the annular space is less. The position of the rotor in the tapered glass tube is dependent only on the rate of flow. The pressure supplied to the machine or any back pressure from the discharge piping has no effect. The accuracy of the Testerate Indicator is within 2 per cent down to 0.25 gpm. Below 4 gpm the tube is graduated in tenths of a gallon per minute, with marks also at 0.05, 0.15 and 0.25 gpm. From 4 gpm to 30 gpm the tube is graduated in gallons per minute.



THE FORD TESTERATE INDICATOR FOR MORE ACCURATE METER TESTING ON SMALL FLOWS

UNFAILING UNDERGROUND ENERGY FOR AIRPORT FLOODLIGHTS





HAZARD ARMORTITE UNDERGROUND CABLE

Non-Metallic Armored

The insulation is Hazard Submarine rubber. It resists moisture. It has long life. Some of the first Armortite Cables, made over ten years ago, are still giving 100% service in airport floodlighting, boundary and runway lighting work.

The protective covering of leather-like non-metallic Armortite tape with a cushion of asphalted jute underneath and with outer coverings of sealing compound and tapes provides sure protection from injury. Soil acids, alkalis or moisture do not affect this thoroughly efficient cable.

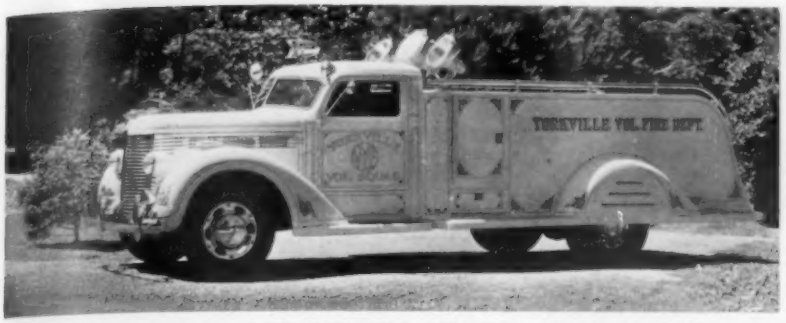
Samples and full data will gladly be sent to anyone interested.

HAZARD INSULATED WIRE WORKS

DIVISION OF THE OKONITE CO.

WORKS: WILKES-BARRE, PENNSYLVANIA

New York Chicago Philadelphia Atlanta Pittsburgh Buffalo Boston Detroit
Seattle Dallas Washington San Francisco St. Louis Los Angeles



THE NEW RESCUE TRUCK OF THE YORKVILLE, OHIO, VOLUNTEER FIRE DEPARTMENT

Rescue Truck Fights Fire and Water

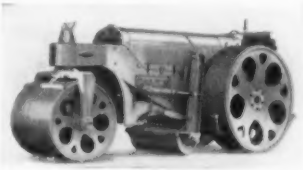
The Volunteer Fire Department of Yorkville, Ohio, has recently purchased an emergency squad truck which is unusually effective as a river rescue unit, as well as being an efficient fire-fighting truck. Close to this village of 2,500 population is the treacherous Ohio River, in which death and destruction lurk, so that the Fire Department must be prepared to cope with the river as well as with fire.

When word is received that the river has claimed another victim, the emergency car rushes to the scene. If the accident happens at night, the truck is prepared to flood the surroundings with powerful marine lights. A 1,250-watt Homelite portable generator supplies the power for a 500-watt Crouse-Hinds center floodlight and two 300-watt searchlights. Stored within the various compartments are respirators, Inhalators, salvage covers and stretchers, in the use of which the volunteer crew is thoroughly trained. There is also a coupling attachment for a trailer which carries a boat for flood rescue work.

When it comes to fighting fires, the truck is equally effective. As it must be prepared to service homes beyond the city water mains, there is a portable pump aboard for use in drawing water from cisterns and streams. This pump has a capacity of 100 gallons per minute and is driven by a self-contained 2-cycle, single-cylinder engine. There are the usual lengths of hose and other fire-fighting equipment. This rescue and fire-fighting truck is built around a Diamond T De Luxe 1½-ton chassis, made by the Diamond T Motor Car Co., Chicago, Ill., with the entire body finished in white and the striping and lettering in gold leaf. The truck has a wheelbase of 163½ inches, a 12-foot body, 72 inches wide, and will carry 20 passengers.

Director of Research for Pipe & Foundry Co.

The U. S. Pipe & Foundry Co., Burlington, N. J., has announced the appointment of Dr. Arthur E. Schuh as Director of Research. Dr. Schuh is a graduate of the University of Chicago, specializing in physical chemistry. Since 1929 he has been associated with the Bell Telephone Laboratories, where he has been responsible for investigations in several fields, such as the protection of metals against corrosion by metallic and organic finishes, the reaction between gases and metals as well as other solids, and the study of plastics and adhesives. He is an active member of the American Society for Testing Materials and the American Chemical Society and is the author of many technical papers on organic coatings and finishes and protective coatings for metals.



THE 3-WHEEL GALION CHIEF

Catalog Describes Galion Chief Roller

An 8-page catalog, No. 225, fully describing the Galion Chief road roller, has recently been issued by The Galion Iron Works & Manufacturing Co., Galion, Ohio.

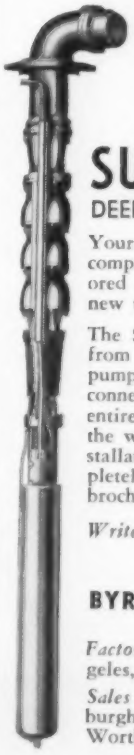
This road roller is offered in both 10- and 12-ton sizes (net weights without scarifier or other attachments and with tanks empty) and with the same frame, transmission, axles, yoke and clutches used with either the gasoline or the diesel-powered unit for both sizes.

The three-speed sliding gear transmission and the final drive are assembled in unit and operate in dust-tight cases in an oil bath. The gears are S.A.E. alloy steel heat-treated for long wear and great strength. All shafts are S.A.E. alloy steel and are mounted on anti-friction bearings. The clutches are the smooth, heavy-duty type. The transmission is mounted in the sub-frame with the power unit. A manually operated differential lock with a dash control is provided for use when needed. The lock is the internal gear type, easy to shift and mesh.

Galion offers a choice of steering arrangements—effortless finger tip hydraulic steering, manual steering with an easy-to-operate gear ratio, or a combination of both built into the roller, with a quick change-over feature. Hydraulic steering is standard equipment unless manual steering is preferred, which is optional at no extra cost.

ENGINEERS
WHO DEAL WITH
PUMPING PROBLEMS

WILL BE INTERESTED IN
THIS **LARGE** FOUR
COLOR CROSS
SECTION DRAWING OF THE
BYRON JACKSON
SUBMERSIBLE
DEEPWELL TURBINE PUMP



Your file of pumping data is incomplete without this 44-inch colored cross-section drawing of this new type deepwell turbine pump.

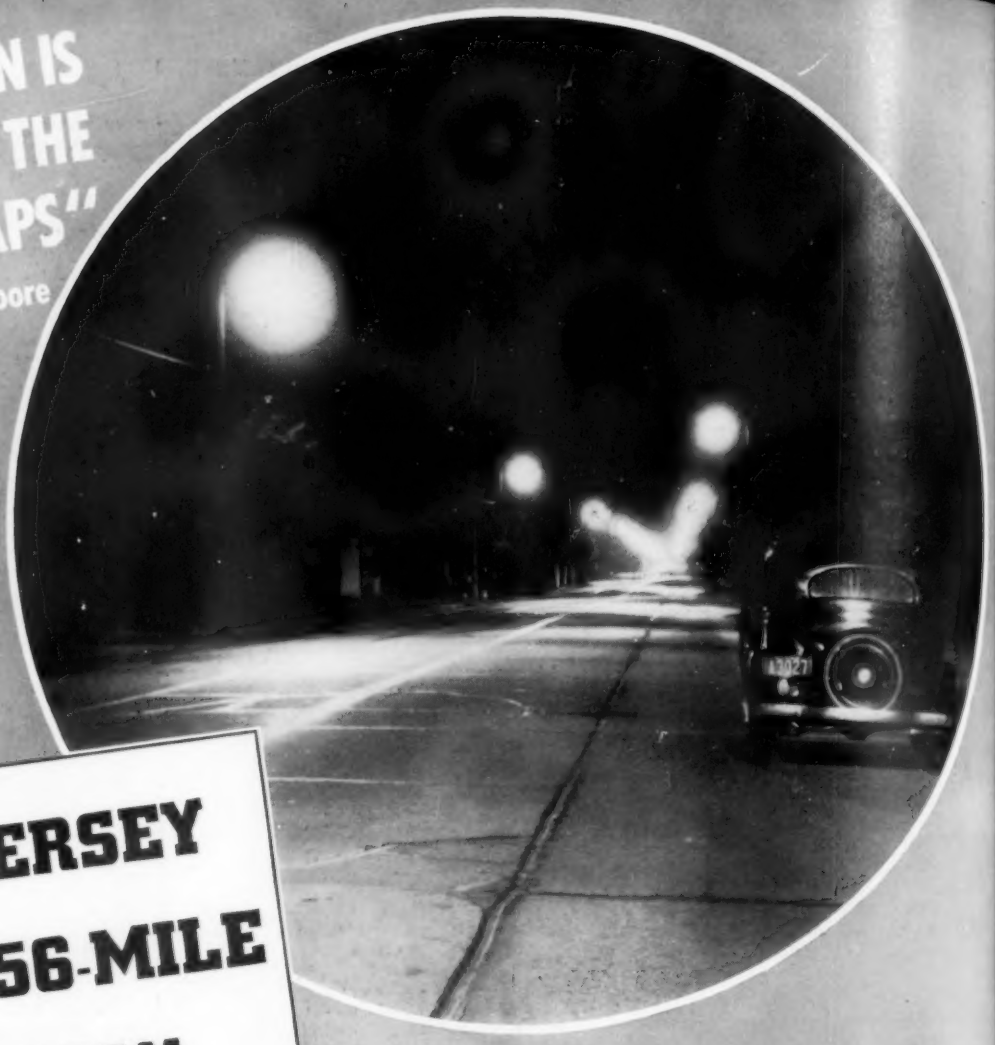
The Submersible differs radically from the conventional type of pump because the motor is direct connected *below* the pump and the entire unit operates submerged in the water. The advantages of installation and operation are completely covered in a descriptive brochure sent upon request.

Write today for your copy.

Established 1872
BYRON JACKSON CO.
Dept. ***M***-18
Factories at Berkeley and Los Angeles, Calif., Bethlehem, Penna.
Sales offices at New York, Pittsburgh, Chicago, Atlanta, Fort Worth, Houston, Salt Lake City

OUR SLOGAN IS "REMOVE THE DEATH TRAPS"

Says Governor Moore



NEW JERSEY LIGHTS 56-MILE HIGHWAY

We are taking care of the known dangerous spots in New Jersey by providing modern lighting. Our slogan is, "Remove the death traps."—Governor A. Harry Moore.

THE New Jersey campaign to remove death traps was advanced another step by the installation of 52 miles, to date, of modern lighting along the White Horse Pike, traffic artery from Atlantic City to Camden. Motorists now find night driving safer and more pleasant as they travel the longest continuous stretch of lighted highway in the world.

This installation is part of New Jersey's program of aiding local communities in the lighting of hazardous state routes within their boundaries. One hundred and sixty-three communities have been granted state aid to light more than 220 miles of highway since last December.

The White Horse Pike is lighted by a new-type incandescent luminaire developed by General Electric engineers. This luminaire is so constructed that glare in the eyes of drivers is reduced. It delivers more effective light per unit of power input than any other luminaire we have ever developed for the wider highways.

New Jersey has made excellent progress in the drive to save lives with safety lighting. Other states and an increasing number of communities also are active in the campaign. If you know of a traffic artery in your community that is especially dangerous at night, look into the opportunities for saving lives with safety lighting. Let us send you complete information on our latest safety-lighting equipment. Write to the nearest G-E sales office or to General Electric, Schenectady, N. Y.

GENERAL ELECTRIC

Pocket-Size Tester for Explosive Gases

A new pocket-size indicator which can be carried about on the job and can be operated by any workman has been announced by Mine Safety Appliances Co., Braddock, Thomas and Meade Streets, Pittsburgh, Pa., for determining the concentration of any combustible gases in sewers, subways and sewage-treatment plants. In size and weight the Explosimeter compares with a small folding camera and can be carried either in a pocket or in a leather case provided with a shoulder strap.

A test with the instrument requires only the adjustment of a single control and the operation of a piston-type pump. The gas concentration is immediately readable on the indicating meter. The sensitivity is such that gas concentrations as low as a few hundredths of one per cent by volume, can be measured. The instrument will also show whether the gas concentration is below, within or above

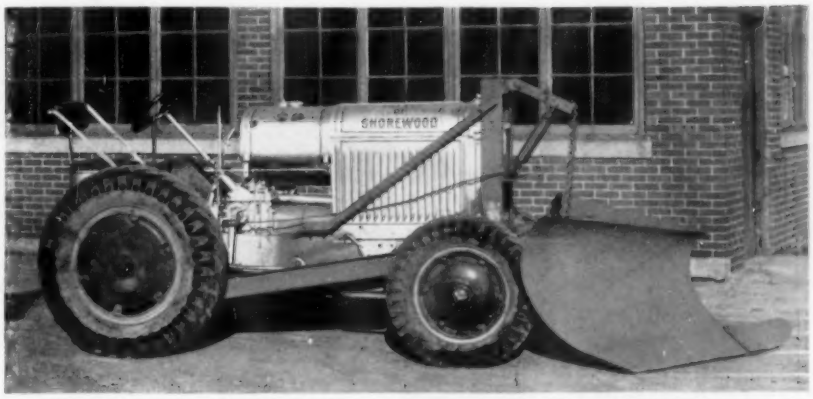
THE M.S.A. EXPLOSIMETER

the explosive range. A dilution tube of novel design which makes possible comparative readings of higher concentrations is available. This is a necessary feature for testing bar holes when locating leaks in buried gas pipe and is valuable also when observing the progress of gas-freeing operations.

The compactness and easy operation of the Explosimeter gives it a wide field of use in public utility and oil refinery service, as well as in distilleries, paint and varnish plants, chemical and by-product plants, iron and steel mills, etc. It is well adapted also to use by municipalities for investigating fire hazards, testing sewers and manholes, and checking for gas hazards in sewage-treatment plants.

Metal Retaining Wall of Cellular Type

A new type of cellular retaining wall has been announced by Armco Culvert Manufacturers Association, Middletown, Ohio, through the publication of a 16-page bulletin entitled "Armco Bin-Type Retaining Walls." The new feature of this wall for use in fills formerly employing cribbing or monolithic structures is the heavy U-shaped column construction designed to increase the strength and stability of the wall. The overlapping units, consisting of stringers and spacers, are securely bolted to these rigid columns to form a series of connected bins which are completely closed on all four sides.



A HEIL SIDEWALK SNOW-PLOW MOUNTED ON AN INTERNATIONAL TRACTOR USED BY THE VILLAGE OF SHOREWOOD, WIS.

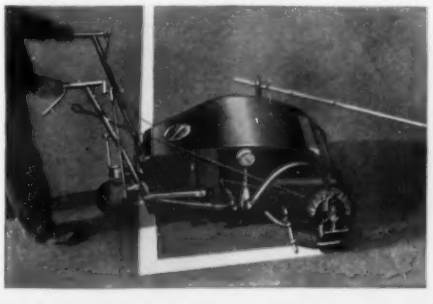
The new wall is of single-bin construction and is adapted to low or high walls, to curves and to changes in elevation of the top or base. The manufacturers call attention to the fact that it is adapted to year-round construction and quick, easy installation by unskilled labor, no curing period is required, and it has 100 per cent salvage value.

The bulletin, H-27, contains a table of sizes, details and suggested plans. A number of uses are illustrated, including slope stabilization, wing-walls, restricted right-of-way, and service along lakes and streams where the primary purpose is to prevent erosion or resist wave action. General installation instructions are described and pictured.

American Public Works Association
Hotel Pennsylvania,
New York City
October 3-5, 1938

WELL MARKED STREETS PROMOTE SAFETY!

Here's a new, all-purpose, self-propelling marker that's equally effective for striping, centerlines (single or double), diagonal or parallel parking, cross walks, safety zones, etc. Paint or hot asphalt. Steady pressure. Variable speed. Exhaust blower and combination spray and brush assures clean, well-defined lines with no drippings or splashed edges.



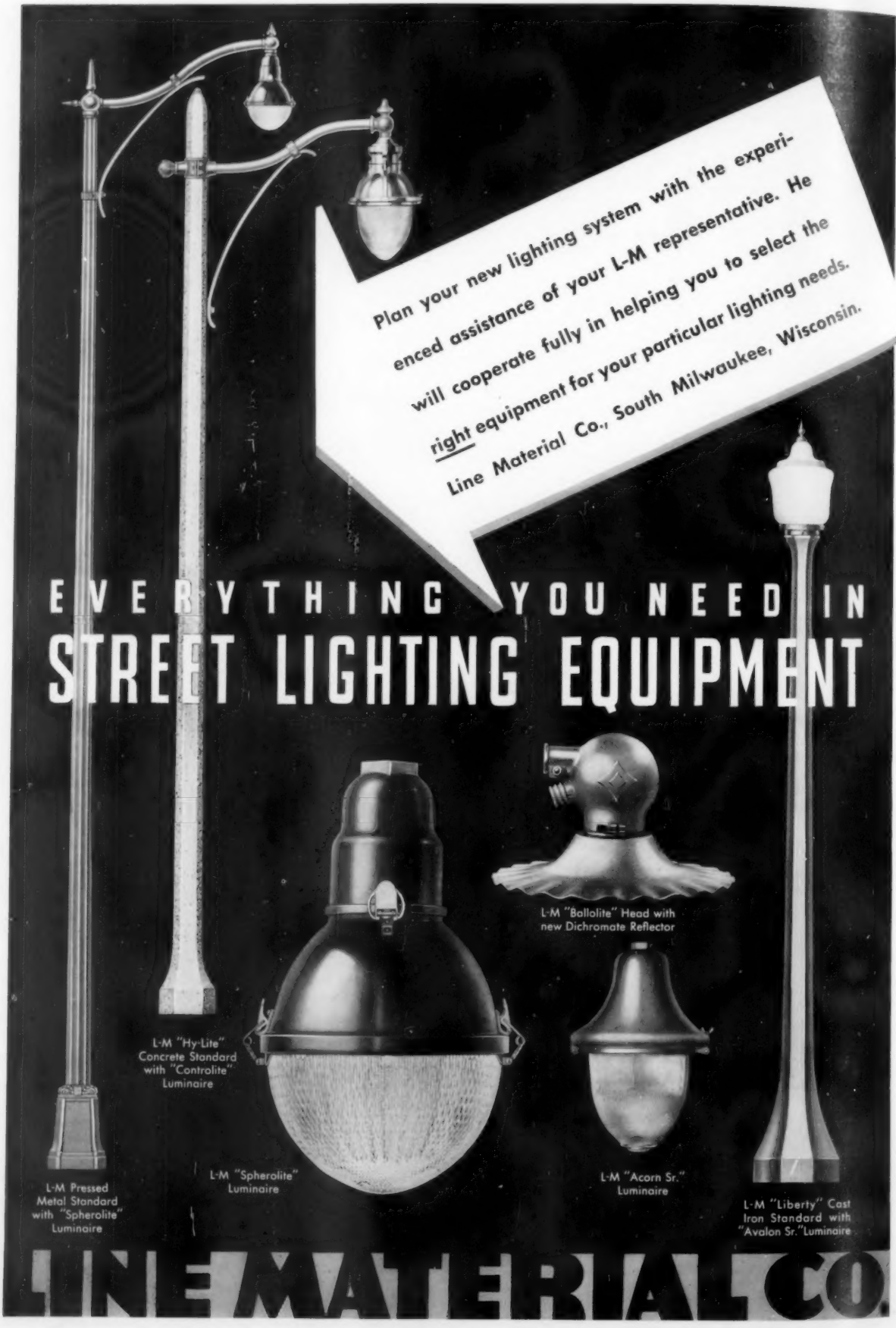
Saves Time and Labor

Easy, one-man, motorcycle-grip control for painting, steering and speed. No compressor required. Low cost. Practically no upkeep. Built by old, established concern with 12 years' experience building road markers. Write for further data.

MEILI-BLUMBERG CORP.
Dept. A-9 New Holstein, Wis.

MEILI-BLUMBERG
AGRICULTURAL and INDUSTRIAL EQUIPMENT

A 2315


Plan your new lighting system with the experienced assistance of your L-M representative. He will cooperate fully in helping you to select the right equipment for your particular lighting needs.
Line Material Co., South Milwaukee, Wisconsin.
EVERYTHING YOU NEED IN
STREET LIGHTING EQUIPMENT
L-M Pressed Metal Standard with "Spherolite" Luminaire
L-M "Hy-Lite" Concrete Standard with "Controlite" Luminaire
L-M "Spherolite" Luminaire
L-M "Ballolite" Head with new Dichromate Reflector
L-M "Acorn Sr." Luminaire
L-M "Liberty" Cast Iron Standard with "Avalon Sr." Luminaire
LINE MATERIAL CO.

Outdoor Lighting

A Section of THE AMERICAN CITY
Devoted to the Lighting of Streets, Highways, Bridges, Airports, Athletic Fields and Parks and the Floodlighting of Public Buildings

Do You Want to Reduce Accidents? Los Angeles Is Doing It

By RALPH T. DORSEY
Traffic Engineer, Los Angeles, Calif.

AFTER three sodium-vapor luminaires had been installed at hazardous Los Angeles intersections in 1936, the public reaction was so favorable and conditions at the intersections were so improved that 68 installations were made the following year. In the first five months of 1938, 26 additional units were installed, making the total for the city 97.

At the first 23 intersections where sodium-vapor luminaires were placed, the number of accidents before installation have been compared with the number since then for an average of 313 days and a total of 7,205 days. Before installation, there were 43 personal-injury accidents, with 76 persons injured and 9 killed during hours of darkness. After installation, there were only 3 personal-injury accidents, with 3 persons injured and none killed.

Of these 23 intersections, 4 are within developed portions of Los Angeles; the others are on main highways in sparsely developed country.

1/3 of the Accidents on 1/50th of the Streets

Safety lighting does not have to be extended on all streets in order to appreciably lower injury, death and property damage. Los Angeles had a year's traffic accident fatality of 526 persons. Although Los Angeles has 2,018 miles of paved streets and 2,924 miles of unpaved streets, with an estimated 25,500 intersections and 450 square miles of territory, 37.3 *per cent of the death toll was restricted to* 125 *miles of main boulevards.* On twelve of Los Angeles' principal boulevards, totaling 125½ miles in length, there were 197 traffic deaths; and 67.6 per cent of all traffic accidents and 77.5 per cent of all pedestrian accidents occurred after dark.

If we had the power of Joshua to keep the sun from going down, it is calculated that 70 lives per year could be saved on these 125 miles of principal Los Angeles streets.

Generally speaking, the area within and immediately surrounding the Central Traffic District of Los Angeles is most prolific in traffic fatalities and injuries. Ordinary street lights are in operation on most of these streets, but this lighting is insufficient to meet safety requirements.

Within the Central District, where advertising signs and neon lights produce a high degree of visibility, there was not a single automobile fatality for the entire year.

INTERSECTION IN LOS ANGELES LIGHTED BY GENERAL ELECTRIC SODIUM-VAPOR LAMPS

SEEING ON A WET, DARK ROAD

IT IS a simple problem to design a lighting system which will produce uniform brightness on a light-colored dry road, because the light from lamps located adjacent to the roadway, on striking the road surface, will be diffused in all directions and the surface will appear bright when viewed from any point.

To produce surface brightness for the automobile driver on a dark or wet road surface requires careful study and involves refinements in luminaire design and placement. Most roads, however, possess an element of specularity, and a lighting system which is effective on a wet road surface should provide adequate visibility on a dry dark surface. In addition, it will produce effective visibility on a light-colored dry road.

New equipment has been developed to meet the requirements of modern road-lighting practice, and many cities have already taken advantage of the new equipment to modernize their street-lighting systems. Adequate accident statistics prove its value.

L. A. S. WOOD,
Chief Lighting Engineer, Westinghouse Electric & Mfg. Co., Cleveland, Ohio.

New Jersey Wears a 50-Mile Belt of Light

By E. DONALD STERNER
State Highway Commissioner, New Jersey

THE longest continuously lighted section of highway in the United States is the White Horse Pike, New Jersey Route No. 43, from Camden to Absecon, recently completed. The 50-mile section traverses 22 municipalities and is lighted by 192 6,000-lumen units, 196 4,000-lumen units, and 811 2,500-lumen units—all incandescent and of the General Electric Form 79-R type (equipped with Holophane refractors). Twenty-four 6,000-lumen sodium-vapor units of different types are installed in adjoining sections near Absecon so that comparisons of the various fixtures can be easily made.

The lighting of this route is practically the final experimental stage in the study being made in New Jersey to determine the relationship between highway lighting and night accidents. Several short sections have been put under observation before; but, to verify conclusions, I directed that a comparatively long and continuous section be selected where the night-accident rate was high, and where various types and sections of pavement were used by practically the same volume and type of traffic.

A careful check of night accident records during the Fourth of July holidays last year, when the route was not lighted, and this year with lighting, disclosed that this route, previously one of our worst from an accident standpoint, enjoyed for the first time in its history an "accident holiday," with not a single night accident.

The regular New Jersey method for obtaining data of this kind is being used—24-hour accident patrols and supplementary traffic counts, along with a careful analysis of each accident reported.

The White Horse Pike lighting is paid for partly from state highway funds and partly by the municipalities through which the route passes; it is part of the general safety program to help municipalities eliminate night hazards on the highways passing through them.

Lights on Chicago's Outer Drive

By OTTO K. JELINEK
Traffic Engineer, Chicago Park District

THE photograph below shows the results of lighting fixtures designed by the Chicago Park District for the Outer Drive Link and approaches dedicated by President Roosevelt on October 5, 1937, as noted here last November. This link connects the South Side Outer Drives, consisting of Leif Erikson and Columbus Drives, with the North Side Outer Drives, consisting of Lake Shore and Beach Drives, thereby providing a bypass to the Central Business District as shown by the photograph.

The inclined approaches to the elevated portions of the improvement are lighted by 17 units of 10,000 lumens, and on the elevated portions 80 units of 15,000 lumens are used. Minor sources of illumination are on pylons and markers, which employ 20 units of 4,000 lumens. The lighting load here totals 90 kw.

The rippled-glass globes are sealed on the reflector, to exclude dust, water and insects and minimize interior cleaning. Placing the lamp up in the reflector reduces glare and directs more light to the street. The use of reflectors and deflectors places the light where it is needed. The luminaires are mounted on 25-foot octagonal poles spaced 100 feet apart.

Courtesy of General Electric Co. and Commonwealth Edison Co.

Chicago's Outer Drive Boulevard system, by-passing the central business district, are lighted by GE 169 luminaires equipped with Gleason-Tiebout rippled-glass globes, mounted on 25-foot octagonal poles made by the Union Metal Manufacturing Co.

Village Plant Lights Streets

THE village of Constantine, Mich., population 1,450, recently installed a diesel plant and distribution system paralleling the private utility lines to serve customers and to light its streets. Three 165-hp 2-cycle Ball Muncie diesels drive 110-kw Westinghouse generators, lighting 300-watt lamps in the residential section and 500-watt lamps in the store district.

The street-lighting system is multiple throughout, and controlled by two time-switches which operate relays connected to the regular distribution-system transformers.

VICTOR E. WILLIAMS,
Superintendent, Municipal Plant,
Constantine, Mich.

OCTOBER, 1938

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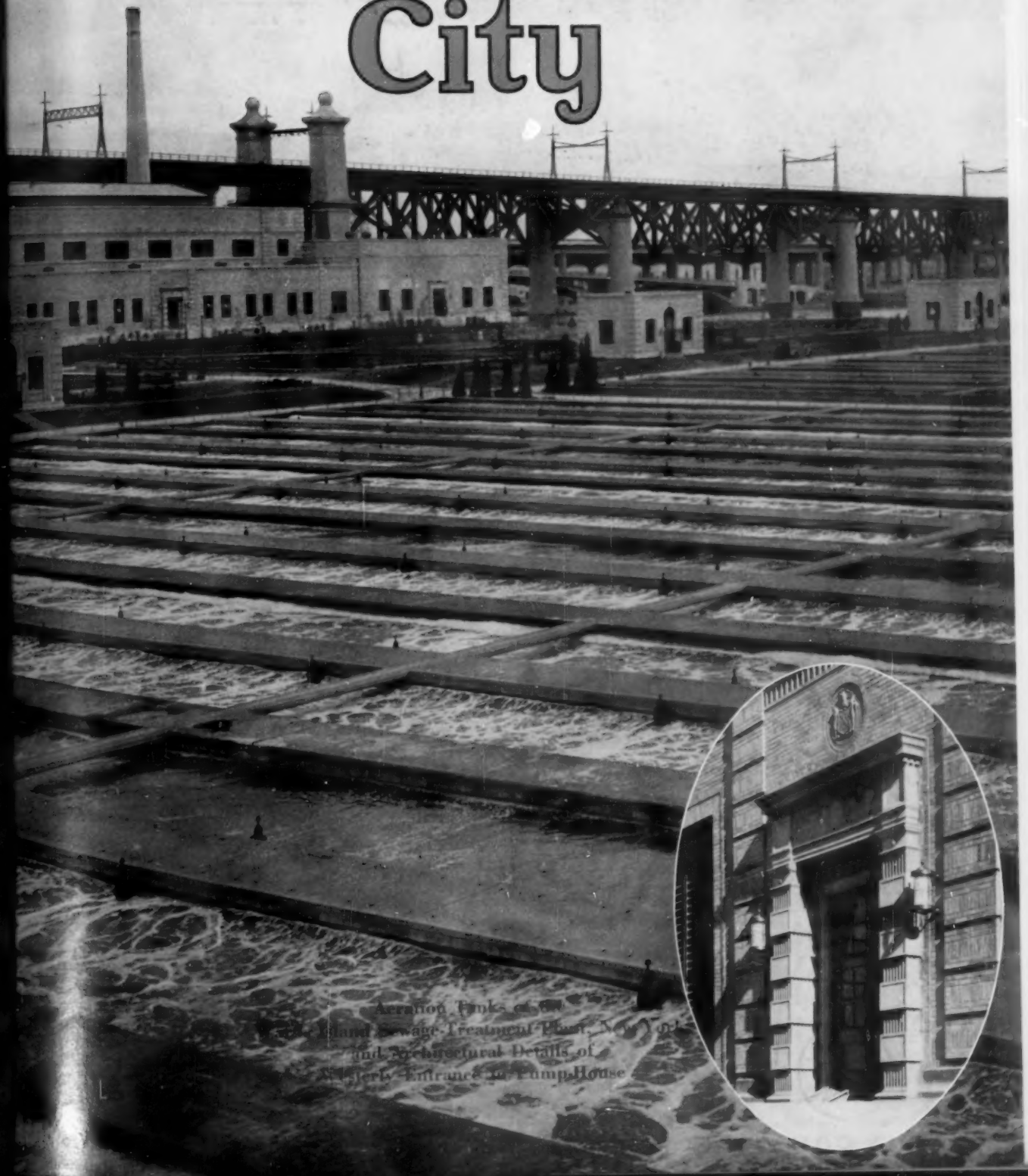
UNIV. OF MICH.

The American City



Aeration Tanks at the
Island Sewage Treatment Plant, N. Y. City
and Architectural Details of
Visitors' Entrance to Pump House